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—OF—

THE PENNSYLVANIA
LIVE STOCK BREEDERS'
ASSOCIATION



PROCEEDINGS AND PAPERS

—OF THE—

EIGHTH ANNUAL MEETING

—HELD AT—

HARRISBURG, JANUARY 23-25, 1907

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Proceedings and Papers of

Eighth Annual Meeting

at the

Pennsylvania Live Stock Breeders' Association

and the

Pennsylvania Dairy Union

Held at

Harrisburg, January 23-25, 1907

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PENNSYLVANIA LIVE STOCK BREEDERS' ASSOCIATION

PROCEEDINGS OF THE EIGHTH ANNUAL MEETING

HELD AT

HARRISBURG, PA., JANUARY 23-25, 1907

PREFACE

January 22, 23, 24 and 25 the State Board of Agriculture, the Pennsylvania Live Stock Breeders' Association and the Pennsylvania Dairy Union held their meetings at Harrisburg. No such crowd of farmers and dairymen ever before turned out to Pennsylvania meetings. The hall was filled to its fullest capacity and at some of the sessions standing room was none too plentiful. All three organizations contributed their share to the success of the meetings, and all worked in harmony. Acknowledgements should be made especially to the officers and committees of the different organizations, who worked hard for their success; to the speakers, who were liberal with their time and energy; to Hon. N. B. Critchfield and his staff, who attended to local preparations and did much for us in many ways; to Henry Palmer and Joshua Sharpless for their work in arranging the Corn Show, to the manufacturers and their representatives who made the display of dairymachinery and supplies an interesting feature, and to many others whom we cannot pause to name.

We again apologize for the tardiness of this report. We regret that it is not more promptly issued and more complete in every particular. But our friends will please remember that we are busy men, that our services are given without compensation, and that all work of this kind has to be done at odd moments.

Our thanks are due especially to The National Stockman and Farmer of Pittsburg, for its contribution of \$100 to the prizes for the Corn Show, and for its assistance in preparing this report. Also to many journals throughout the state for their courtesy in publishing our announcements.

We feel that the era of real progress in Agriculture, Live Stock Husbandry, Dairying, Horticulture, etc., in Pennsylvania has just opened. With a stronger agricultural college than ever before, with better organizations and more of them, with good markets present and prospective, everybody should feel encouraged and go to work to spread the gospel of progress.

W. E. Perham,
Sec'y Penn'a Dairy Union.
E. S. Bayard,
Sec'y Penn'a Live Stock Breeders' Asso'n.

At the close of the business of the State Board early Wednesday evening, Hon. W. C. Norton, President of the Pennsylvania Live Stock Breeders' Association takes the Chair, and the remaining part of the session of Wednesday evening, January 23rd, is conducted by the Breeders' Association.

President Norton: Gentlemen: I am glad to see so many faces here tonight. As we have several good speakers to be heard, the President's address will be dispensed with. The first number on the program is a paper by A. E. Norton. My son is unable to be here at this time, so we will omit

that.

Prof. Harry Hayward is here, and as he will have to leave tonight, he has requested that we give him the first place on the program, and as I suppose there will be no objection, I will call on Prof. Hayward.

Prof. Hayward: I want to express my pleasure in coming to the Pennsylvania meeting, and seeing so many of my old friends. My joy is dampened by only one thing, and that is the necessity of leaving tonight for Chicago. My paper will, therefore, of necessity be brief.

Prof. Hayward's paper was as follows:

PORK PRODUCTION IN THE EAST.

By Prof. Harry Hayward, Director Delaware Experiment Station

That pork production is an important agricultural industry is shown by the fact that, in the year 1900 the average private family ate a little over half a ton of meat, nearly half of which was pork. In other words, the total amount of pork consumed in the United States is nearly equal to the total consumption of beef, veal and mutton.

These facts are explained by another fact and that is, pigs for various reasons are more profitable animals to raise than beef, steers, or sheep, and on this account always have, and probably always will occupy a prominent place in American Agriculture. Of the reasons which tend to make pork production profitable, a few of the most important may be of interest. In the first place, pigs are more prolific than any other class of farm animals, they mature more quickly, and can therefore be turned off sooner than any other live stock save poultry. Again, a pig produces its meat upon considerably less feed than any other meat producing animal, much of which, moreover, could not be used advantageously in any other way. A pound of pork can be produced upon half the amount of feed that is required to produce a pound of beef, and two-thirds as much as it requires to make a pound of mutton. Still another point in favor of the pig is, that the percentage of dressed weight is higher than in either beef or mutton. The average fat hog will dress about 80 per cent. of his live weight.

There is probably no branch of Animal Husbandry which can be taken up with such a small outlay of capital as raising pigs. They can be kept in comparatively large numbers, in small inclosures, or they will do very well on pasture which furnishes a part of their feed, and they are subject to but few diseases. As our population increases the demand for pork on account of its palatability and nourishing qualities probably will also increase, and it is to discuss some of the questions that will arise in meeting this demand that this paper has been prepared.

According to the last census Pennsylvania has a little over a million head of pigs, while states like Illinois, Louisiana, Indiana and Missouri have from three and one-half to ten millions. If these states that are so far from the markets find it profitable to produce pork, why can not the Pennsylvania farmer make it more profitable, since he can grow about every kind of crop that the farmer farther west can produce, and has one of the best markets in the United States at his very door?

With the prices of dressed pork hovering around the nine cent mark, I am strong in my belief that the farmers of this state can well afford carefully to consider the feasibility of making pig raising on a moderately large scale one of their principal sources of revenue. I have had enough experience in handling a herd of from one hundred to two and fifty head to believe that this is one of the easiest ways in which the eastern farmer can solve the labor problem; a very serious matter just now on most farms.

If a farmer is inclined to make pork production a large factor in his farm economy, he should make his plans carefully, and be sure of his ground in order to forestall subsequent losses and disappointments.

In view of the knowledge we now have, few would think of trying to grow pigs even on a moderate scale without the use of the pasturing system unless located near a city where garbage is available. This system calls for a very small area of tillable ground per head, which in course of time should become richer and more productive by the use of legumes and the dropping of the animals. Considerable thought should be spent in planning the layout of the yards and lots that the maximum amount of work may be done with the minimum amount of effort. The buildings should consist of a store house or granary in which could be stored at least a car-load of feed such as bran and a root cellar. Beside this, there should be half a dozen or more small farrowing pens that could be warmed in case of sows farrowing in very cold weather. These buildings could be arranged in relation to the feed and pasture lots so that they could be easily reached with a car running on an overhead track. While such a plan will slightly increase the initial cost of a pig raising plant, it does away with the necessity of carrying the feed by hand, which is out of the question where as many as fifty hogs are kept, and not only does away with the expense of a horse and wagon, but the feedways are not cut up in wet weather, thus eliminating a disagreeable feature of most piggeries. With a little thought in arranging the overhead track most of the lifting, and much of the unpleasant sloppiness so prevalent around hog houses can be avoided. With an arrangement of this kind one good man will be able to feed and care for from three to four hundred pigs. In regard to pig houses, experience has demonstrated that the Lovejoy house, eight feet square, made of rough hemlock board well battened, is very satisfactory in most climates. These houses will accommodate about eight two hundred and fifty pound hogs, will answer as farrowing pens in moderate weather, are cheap, and in case of an outbreak of disease can be thoroughly disinfected or even burned without much expense. Too much care cannot be given to the fences on a big farm, as a breachy pig is as bad as any other farm animal that acquires the habit of breaking out. The best fence is of boards, but on account of the high price of lumber, such a fence cannot be considered, if one wishes to practice economy. The most practical pig fence perhaps is one of fairly heavy woven wire from 26 to 30 inches high, with a strand or two of barbed wire stretched above it.

If a fence of this kind is put up carefully so that it will be tight, the posts braced firmly, and the bottom of the fence stapled to stakes or small posts firmly set in the ground between the posts it will be pig proof and should last a long time.

The Selection of a Breed.

From an economic point of view one will find upon studying the results of breed tests at a number of Experiment Stations that certain breeds do not produce pork uniformly so cheaply as do other breeds. On the other hand I do not think this difference great enough to offset one's own personal likes and dislikes in the matter of breeds. I think it true that as yet few, if any, of our markets distinguish enough in price between the so-called lard and bacon type

of pigs to justify a preference for either type from a market standpoint. On account of the reasonable price for which pure-bred sow pigs can be bought, and as a pure-bred male is essential to success in any case, it seems reasonable to advise the use of pure-bred pigs rather than grades in general pork production. It costs no more to grow the pure-bred animal, and with but little care one may easily dispose of a pure-bred pig at two months of age for as much as he can get for a fat grade pig at eight or ten months of age. The more popular the breed selected the more easy will it be to make satisfactory sales of breeding stock. Go slowly on new or unfamiliar breeds. Few breeders are able to popularize new breeds so as to make many or good sales.

Feed and Care of Breeding Stock.

In feeding brood sows there are three points that should be constantly borne in mind. First, to supply the nutrients necessary for the proper nourishment of the sow, and the litter she is carrying; second, to make the ration bulky enough to keep the system open and in good condition, and third, to make it as cheap as possible. During the growing season such a ration can be supplied at a minimum expense by feeding about two per cent. of the sow's weight of three parts corn and one part bran or middlings, tankage, soy beans or cow peas, the remainder of the ration being supplied by allowing the sow to run on clover, alfalfa or some other leguminous pastures. In winter cut clover or alfalfa hay mixed with the grain, together with a sugar beet or two or mangels will make a good substitute for the pasture. The sows as well as the boar should have abundant exercise, and in placing the houses in the lot where the pigs are confined care should be taken to plan to have the feeding place as far from the sleeping quarters as conditions will allow, so as to enforce exercise in cold weather.

In order to have the pigs ready for an early market in the fall they should be farrowed in March, the earlier in the month the better. If the sow's next litter comes the first of September, they will be in good shape to market the following April when prices are nearly always good. In this way the brood sows produce two litters a year, and by a little extra care they are ready to sell when the market is usually at its best.

It requires considerable skill to start young pigs without skimmilk, and keep them going until marketed. The faster they grow within reasonable limits the greater will be the profits. One of the important factors in this connection is the sow herself. Unless she is both a good feeder and a good milker, no matter how skillful her care may be satisfactory results can not be obtained. On the other hand given an ideal brood sow unless the feeder is a pig man, he will not be able to feed the sow with the cheaper foods in such a way as to make the sow give her maximum amount of milk and make it agree in all cases with the sucking pigs. Henry has demonstrated that it requires no more food to produce one hundred pounds gain in the pigs when fed to the sow and pigs before weaning than when fed to pigs alone after weaning. This fact would seem to indicate that the more milk the sow can be induced to yield the more rapid will be the economical growth of her pigs. If skimmed milk is available at this time, the difficulties attending the feeding of the brood sow while nursing her pigs are materially lessened. The milk should be fed with grain

enough to make a fairly thick slop. Light grains such as white middlings, red dog flour, ground oats with a little corn meal being preferred. Henry also found that it required 230 pounds of mixed grain and 530 pounds of skimmilk to make 100 pounds of gain in young pigs under these conditions at a cost of about \$3.35. If, however, skimmilk is not to be had, a mixture of two parts finely ground oats with one part of wheat bran and one part white middlings with five to ten per cent. of tankage allowed to soak between feeds is a satisfactory ration; to assist in keeping the system open a few roots or access to pasture is desirable.

At the age of about three weeks the little pigs should be encouraged to eat by scattering some shelled corn on a clean floor, or by allowing them access to another pen, or a shallow trough of milk into which has been stirred a few middlings. From now on until they are weaned, their food should be increased and strengthened, care being taken that they have plenty of exercise that they do not become too fat.

At the age of eight week the pigs should be ready to wean. This is a crisis in the young pig's life, and the skillful manager will see to it that the pigs are not checked in their development at this time. This can be done providing they are kept warm and dry, that their food is suitable, palatable and properly prepared, and that they are not over-fed at any time. If they are never given quite all they will eat their appetites will keep keen and thus they may be made to eat the maximum amount of food to the best advantage.

From the time the pigs are weaned until they are shipped, the question is to produce the greatest gain at the least expense. This involves not only keeping in close touch with the feed market, selecting the cheapest one and buying when the price is low, but it also involves a knowledge of how to blend the growth producing and fattening foods in such a way as to get a pig large enough to weigh from 225 to 250 lbs. when about eight or nine months old.

It is probable that in no way can pork be made more cheaply than with grain on pastures, provided the grain and the pasture is of the right kind. Experiments at a number of different stations have shown that it requires from one-fifth to one-third less grain to produce one hundred pounds of pork with pasture than without it. While this is no doubt true, care should be taken not to try to over do the matter of pasture, especially with young pigs. Young pigs need more protein than older ones, because they are growing rather than fattening. In consequence, the young pig should receive for some time after being weaned a ration equivalent to two parts of corn meal and one of middlings, with a little tankage perhaps aside from access to good clover, alfalfa, oats and peas, or cow pea pasture from which he will get considerable protein. On this sort of pasture, as the pigs grow larger, the proportion of corn may be increased until they have attained the weight of about one hundred pounds, when corn alone may be economically fed, unless perchance corn may be high and protein feed proportionally low in price. Under usual conditions, however, the nitrogenous feed are so high that, although their use undoubtedly would make more rapid gains, they are obtained at such an increased cost as to render their use inadvisable. Pigs should be so fed that they will gain from one-half to one pound a day from the

time they are three weeks old until they are marketed. It is impossible to make anything like this gain on pasture alone, but on the other hand the Montana Station has found that it is possible to feed more grain than is necessary to make the maximum gains. It seems, too, that in order to get the best results from the pasture it is essential that the pigs be allowed to graze rather than to have the green feed cut and brought to them. Whole grain fed on pasture should be ground or soaked with the possible exception of corn, which may be fed on the cob or shelled. It will pay, however, to soak old corn before it is fed, as soaking is equivalent to grinding and is much cheaper.

It was further found at the Utah Station that pigs in pasture consisting of about half alfalfa and a full grain ration gained 1.3 pounds per day, and that 417 pounds of grain were required for 100 pounds of gain. In pasture and three fourths grain ration the daily gain was 1.2 pounds and 377 pounds of grain required for 100 pounds of gain. On a half grain ration the daily gain was .87 pounds and 352 pounds of grain required for 100 pounds of gain. Another rather peculiar conclusion drawn from the Utah Experiments was that exercise alone increased the gain 22 per cent. and the amount eaten but 1.5 per cent., but decreased the amount required for one pound of gain 22 per cent.

It requires considerable skill and forethought to arrange to have desirable pasture available during the greater part of the growing season. Assuming that the land devoted to pig pasture is fairly fertile, the following plan will perhaps yield satisfactory results under average Pennsylvania conditions where alfalfa is not as yet a certain crop:

The earliest pasture that can be had is rye, and although its food value may not be great, it will serve to tone up the system and induce better appetite and faster growth. Hairy vetch, red clover, oats and peas, rape, gem sorghum, soy beans and cow peas may follow each other. Climate, soil, and other conditions will probably serve to exclude some of the crops. It is quite certain, however, that from this list a rotation may be had that will give anywhere in Pennsylvania a succession of suitable pasture for hogs. The great advantage in supplying such a course of pasture is that many of them supply in a very cheap manner protein which is needed for rapid and economical gains.

Winter Feeding.

Growing pork in the winter months is a little more expensive than it is in the summer season. However, we have never had pigs do better than during the winter in open feed lots with Lovejoy houses for shelter. In winter as in summer the ration for growing pigs should contain considerable protein, although not so much is needed in cold weather perhaps as in summer. It has been found that for the most economical gains in pigs the nutritive ratio should be about 1:6.5. Then nutritive ratio of corn is about 1:10. A part of the winter ration can well be composed of alfalfa or second growth clover hay, cut fine and mixed with meal, or in the case of brood sows be fed from racks.

In some experiments in Nebraska a ration consisting of 80 per cent. corn meal and 20 per cent. chaffed alfalfa produced as much gain as a ration of 80 per cent. corn meal and 20 per cent. middlings. Sugar beets or mangels fed raw in mild weather and cooked in freezing weather can also be used advantageously in winter feeding. Not so much on account of their nutritive value, as their value to keep the system in such a condition as to increase assimilation.

In regard to the difficulties in growing pork in the East or anywhere else they may all be summed up in the one word—sanitation.

The sanitation of the piggery should be guarded as carefully as the sanitation of a hospital. Damp and illy ventilated sleeping quarters are fatal to pigs and unless the owner will see to it that his hogs always have a dry and well ventilated place to sleep, he had much better keep out of the business. Overcrowding is an evil in pig growing that must be guarded against.

It is my firm belief that at least half, if not more, of the outbreaks of disease are due to overcrowding young shotes. The younger and weaker ones become so unresistant that finally they succumb to the germs of the cholera or swine plague, which I understand are always present even in very healthy pigs. It is simply impossible to crowd young pigs and this point cannot be too strongly emphasized.

President Norton: We shall be pleased to have this paper discussed briefly.

Mr. McSparran: I would like to ask the Professor whether he has ever experimented with linseed meal as against tankage?

Prof. Hayward: Yes, sir; I have; I think tankage is cheaper.

Mr. McSparran: That is the point I want to make—because it is cheap.

A Member: What is tankage?

Prof. Hayward: Tankage is a mixture of ground meat and dried blood which is being put out by slaughter-houses, and is largely used for feeding hogs, particularly in the middle west—in Kansas and Nebraska.

A Member: What proportion of it would you feed?

Prof. Hayward: About five per cent.; it depends largely upon the size of the hogs.

A Member: I want to ask whether the by-products of the farm would not answer as well as the tankage you buy in the city?

Prof. Hayward: Yes, and be cheaper, too, although I think the tankage put on the market by Armour and Swift is an excellent thing.

A Member: The by-product of hair is all taken off?

Prof. Hayward: They burn that off.

Mr. Hargett: You must excuse me, for I am a stranger; I am from Maryland and have farmed all my life, and I know a little of everything and not much of anything, but I want to say that this by-product of hair is one of the best things we have ever tried for growing potatoes. After planting the potatoes lay the hair over them and note the result.

A Member: Will the potatoes have hair on them?

Mr. Hargett: No, sir.

Secretary Critchfield, (from the bald-headed row): I guess I must have been planting potatoes.

Mr. Hargett: Now, Mr. President, this is not an evolution of my own, but we had a lady from California visiting us who is very fond of flowers, and she told me that her Chinese servant insisted that the hair that came out in her combings would make her plants grow; to satisfy him she tried it, and they grew wonderfully. Now, I thought that idea might be applied to the potatoes, and I have used it with remarkable success.

Mr. McSparran: Does the Secretary's wife raise flowers?

Mr. Mr. McCreary: I would like to ask the Professor what he values skim milk at per hundred pounds.

Prof. Hayward: I have always thought it worth about twenty cents if fed to hogs weighing under twenty-five pounds; if fed to hogs weighing over twenty-five pounds it is worth more than that.

Secretary Hayward: What do you figure the pigs at?

Mr. Bayard: Pure-bred hogs are worth from \$100 to \$300.

President Norton: Any more questions? If not, we will take up the next subject, which is an address by the Hon. W. M. Hays, Assistant Secretary of Agriculture of Washington, D. C.

The address of Mr. Hays is as follows:

AGRICULTURAL EDUCATION

Address of Hon. H. W. Hays, Assistant Secretary of Agriculture, Washington, D. C.

Ladies and Gentlemen: I am glad to be with you tonight, and I am proud to be with you. I am proud of your great state. I have been living near it recently, and have become better acquainted with it. In my boyhood days I heard much about it from my Pennsylvania German relatives, but it is only recently that I have become personally acquainted with it, and have learned from my own observation how great it really is.

I have just learned from your Secretary this evening that I was down on the program for two speeches. I did not know I was expected here last evening. I received the program with a red pencil mark over Wednesday, the 23rd, and supposed I was to be here for this evening only. I don't know whether the mistake was made at my office, or whether it is to be credited to your Secretary. (Secretary Critchfield says it must have been made at the Washington office, as they use blue pencils here). Well, if that is the case, I am sorry for it, and will have to try to cover the two speeches in my address of this evening.

As each hour has its duties and each tilting of the world's axis has its seasonable work, so each decade brings up for solution its own problems. Our country has taken up one after another such political questions as self-government, freedom of speech, the freeing a race of slaves and the curbing of dominating capital. In education the first forward movement was to secure private schools, then came the movement for free primary schools. The establishment of academies and colleges followed, to be in turn succeeded by a movement to establish free city high schools and normal schools; also state colleges and universities partly or quite free of tuition charges. Each of these types of schools has been devised to form a wheel in the educational machinery which we, as a people, are gradually perfecting.

The educational philosophy of the older, church-governed schools which long ruled our educational policy has been powerfully modified by research in the sciences and by development in the industries, arts and professions. The curriculum once confined to classical learning has broadened out so as to cover the practical as well as the theoretical and the aesthetic. Some of our very best philosophy of education is now found in the minds of those teachers who are successfully reducing to pedagogic form and weaving into our educational scheme the essentials of education in the industries and home-making. When the older philosophy met the problems of technical education it said: "Educate the man first and the specialist afterwards." Its plan was to give the man a general college course and give him his technical work in a graduate course. That plan limited technical education to college men. It was the aristocracy of educa-

tion for the few in the professions. If that philosophy had been persisted in it would have been the most un-American of follies. The persistency with which this mistaken policy was pursued was due almost wholly to the fact that school teachers cling most tenaciously to the educational philosophy of the schools where they were taught. Among the most intolerant things done in American life stands out the persistency with which our educators go into a new community and disregard the local interests important and dear to the parent and pupils, placing the school emphasis too nearly all on the remote, as on the possibilities of becoming President, or on the language of a people who knew far less than we, failing to give the youth information about the things with which he or she must deal. But far worse, this course tends actually to rob the pupil of his or her inspiration for the practical affairs of the home, the farm, the shop, or other work in which at least 90 per cent. must engage.

The broader plans coming into our schools have been largely thrust upon the school men by men of affairs, as in our cities, and by legislators. The success of combining industrial, technical, and scientific studies with the general studies, thus brought about, often under suggestions from school men, shows that the philosophy of many of the older educators was wrong. The Congress of the United States by passing the land-grant act of 1862 establishing State colleges of agriculture and the mechanic arts, did more than all other agencies to broaden the philosophy adhered to by the older schools. At first the mechanic arts were brought to a pedagogic basis; then agriculture slowly but surely was brought to teachable form; and last, home economics were successfully brought into the domain of the school. I believe there are now no administrators of these colleges who are so conservative as not to be thoroughly in sympathy with collegiate education in engineering; most of them have risen to a belief that agriculture has been reduced to teachable form; but some still have little faith in the possibility of teaching domestic subjects. Legislative bodies, ever more ready than teachers to turn our schools into practical lines, have their minds open to larger plans for public education. These men who see the broader economic and social movements of our country and our States have come to believe profoundly in scientific, technical, and industrial education and research in relation to our productive industries, in relation to home-making and in relation to our social and civic life. As the management of a great railway system is willing to make expensive surveys preparatory to the proper construction at not too great cost of proposed improvements in order that larger net

profits may accrue to the road, so our legislators are ready to have the people's money collected and expended in making the people more efficient in creating and enjoying wealth.

The new school movement springing out of the Congressional land-grant act of 1862 offers some facts of interest to legislators and to all who are interested in our youth. These colleges (figures of white pupils only available. Colored schools relating to the industrial are mainly of secondary grade), with 12,334 students in engineering courses, 7,272 in agriculture, and 854 in home economics, most of whom are competing for collegiate degrees, cannot offer their training in practical studies to more than a very small number of the 26,000,000 school children of the country. All will agree that inquiries should be made concerning the best way to supplement these colleges, so as to carry this education down through all the schools, so as to carry instruction and inspiration into all three practical lines of effort to all our youth. As an outgrowth of the engineering departments of these State colleges, instruction in the mechanic arts has been very successfully introduced into the numerous city high schools of the country. Evidence of the utility of the mechanic arts city high school is arising from the effect they are having on the mechanical industries. Manufacturing firms, for example, are seeking in these schools the young men and young women who show an aptitude for expert work, a genius for invention and new construction, an instinct for managing men, or abilities for promoting and conserving financial affairs. As a result of the agricultural work of State colleges more than thirty of the needed two or three hundred agricultural high schools have been organized by the different states, two having established one such school in each Congressional district. Home economic education, first organized in agricultural colleges, is rapidly spreading into all city high schools, agricultural high schools as well as privately endowed schools of secondary and higher grade and even into primary schools. In towns and cities too small to establish separate mechanic arts' schools, more or less mechanical and home economics instruction is introduced often as elective subjects in the regular high school courses of instruction.

The little rural school, so long the most backward in catching step with modern progress, is beginning to take new form. Education in agriculture and home economics once it is fairly started toward all farm boys and girls promises to be too strong for the conservatism of even the isolated rural school. These schools have amply demonstrated that in their present form they can not properly handle these two new lines of work. It has been shown that they need to be born over into new life which will fit them for their part—a most important part in the evolution of modern agriculture and modern home-making. The one-room school must become the four-room consolidated school, so that a man trained to teach agriculture and a woman trained to teach home economics may here find that fair wage and that long tenure of office which will warrant them in thoroughly preparing for their important tasks. The faculty of four or five teachers can conduct a ten-year course extending through the eight primary school years and two years of the high school for the 150 children from as many farms in an area of 25 square miles. The cottage of the principal; the plantations of timber, fruit,

vegetable and ornamental plants; the plots for field crops, fertilizer demonstrations and farm management lessons; the laboratory and practice room; and the vital connection the teachers can have by co-operating with parents in the work on the farms and in the homes will weave strongly into the pupils' nature the elements of a true education in country life. With the schools thus organized there is provided in the country a far broader child-life than has yet been conceived for city youth. How can the nation better expend some of its wealth than by thus making provision for well-nigh ideal conditions of fatherhood and motherhood in our country homes? Two hundred of the needed 40,000 consolidated rural schools have been established, and practical studies in agriculture and home economics are slowly but surely finding their places in them.

Education in the city industries in agriculture and in home economics having become successful elements in our public education it is not too early to inquire how they may best be brought freely to all American youth. No one can doubt that the introduction of these subjects generally into the secondary and primary schools will materially increase the cost of our public schools, nor that this added cost will several times over return in the greater earnings and in the better homes of the coming generation. Those who have most closely investigated the subject believe that the general adoption of industrial education is in the same category as were the adoption of the steam engine, the self-binder and the sewing machine. The vast expenditures of these mechanical inventions would have seemed more appalling fifty years ago than would now the added cost of industrial education. Our scheme of education for city life is rapidly taking form for the non-agricultural classes in our tripartite system of primary, secondary and higher schools. The great bulk of this work provided for by public taxation is organized under an articulated system of eight years of primary, four years of secondary or high school, four years of collegiate work with one or more added years for graduate courses. The privately endowed schools of primary and secondary grade are no longer rapidly increasing their numbers nor their income, though their value is and will continue to be second to that of the rising public school system. Persons with private funds to give to good causes are more and more recognizing that public funds are to carry the main burden of primary and secondary schools. Even the colleges and universities of non-public character are meeting most powerful rivalry from State colleges and State universities.

The city youth early gains a position on the educational ladder, and with the hope and enthusiasm of youth he looks and climbs upward. The system ever leads him on as if all could find occupation at the top. But necessity to labor for sustenance and other causes compels or induces 98.6 out of a hundred (from statistics of attendance in private and public schools and colleges throughout the United States in the 1904 Report of the United States Commissioner of Education) to stop short of the college ladder, and 9.4 out of a hundred to stop before leaving the primary ladder and labor in the fields, shops and homes. Higher education is very important; secondary education even more important; but the great work of the schools must be done in the primary schools. The main function of our secondary and higher schools is clearly to

prepare teachers for the primary schools.

The city-life system of education will prepare those who are to continue on their educational course none the less well if the lower schools devote a fair amount of their time to education relating to the sustaining industries. And there will be a far better self-selection of those who are to continue in school that they may prepare for the pulpit, for the bar, for the teacher's chair, or for the engineer's or technician's post. The wider experience of the pupil who tests his own powers and interests with the natural, industrial, and home-making objects and subjects will enable him earlier to find himself; so that fewer mistakes in choice of a life vocation may be made.

When our city secondary schools freely offer to all pupils training in the mechanical industries and in home economics, teachers will be trained who know the educational value of these subjects from the standpoints of scholarship, mental power, industrial skill, and broad, practical citizenship, and who can successfully introduce these subjects in an elementary way in the higher grades of all our city and town primary schools. Clearly there is no need in the curriculum and plan of our city high schools for instruction in practical subjects that those who are to be teachers of our lower schools may have knowledge, interest and inspiration regarding these broad fields of industrial and household work with which most of the people throughout their lives must daily deal, and that very many leaders with higher standards of skill and efficiency may be provided for all our industrial and home-making work. Laborers trained in their work, however simple; artisans skilled in their expert labor; technicians schooled, specialized in their duties; foremen, managers, and heads of manufacturing, transportation, and commercial enterprises made alert to see the inter-relations of industrial processes—the web and woof of our great non-agricultural industries—will make splendid use of a far more highly developed practical school training than our country now provides them.

Country-life education has not had the advantage of centralized population and wealth. It has not developed the needed leaders. Its problems have been more difficult; its organization has been more slow. While the State colleges of agriculture and mechanic arts were designed by Congress to keep agriculture and our splendid country life at the front, some of these institutions failed for a quarter of a century and more to make a success of their agricultural instruction. Many causes operated to retard the successful development of collegiate courses in agriculture. General education requiring only class rooms, chairs, blackboards and books and scientific education requiring in addition only laboratories became first installed in many of the institutions and long held the chief place in the minds of college presidents and boards of trustees. Entering vigorously upon agricultural education necessitated the additional expenditures for practice laboratories and practical work on the farm, and for expensive herds of live stock and for other costly equipment. The collegiate faculty most of whom were educated in the older schools could not resist the temptation to enter a race for large number of students with general colleges, thus hoping to gain favor with legislatures, and most of the funds were used for courses which could easiest be made popular. Fol-

lowing the ideals of the older educators, the technical and practical studies in agriculture were at first put toward the top of the collegiate courses. The assumption now proved erroneous that the farmer should be afforded as long a course of college study as persons preparing for technical professions. At first there were not so many positions open to the trained agriculturist as to the graduate of the general and scientific courses, which became popular as preparatory college courses for those desiring to take their graduate work in law, medicine and other professions. Lack of a substantial body of agricultural knowledge and business principles in pedagogic form were also at first a very great hindrance to the development of education in agriculture.

The engineering courses of these colleges on the other hand had less to handicap them. In the various lines of engineering a definite body of knowledge and practice work was early brought together in splendid form for teaching. The rapid growth of industrial, transportation, and merchandising enterprises afforded large numbers of salaried positions, paying even better wages than positions to which general and scientific collegiate courses led. Students seeing the halting and unsatisfactory character of instruction in agriculture, naturally flocked to the courses of study which seemed to give them individually the best opening. Presidents and boards of trustees traveling the lines of least resistance responded to the development of general and mechanic arts' courses and failed to secure from the legislatures the large necessary equipment for agricultural education.

During the last one or two decades one State College after another has succeeded in bringing forward its agricultural instruction, and today success has been reached in a large proportion of these institutions, giving assurance that this class of collegiate education has a grand future.

Success had hardly been attained in collegiate courses in agricultural education when secondary schools for agricultural education began successfully to develop. In 1888 the University of Minnesota began an experiment at developing an agricultural high school course. This experiment is of none the less value, and of all the greater interest, because it was an outgrowth of the failure of agricultural courses of collegiate grade to gain a foothold in a State university. Just as Congress by its land-act grant forced colleges of agriculture upon the states, this agricultural high-school movement was injected into the school system upon the initiative of farmers and business men. At present between thirty and forty agricultural high schools have been established in the United States.

In one line of country-life education school men and non-school men have together taken up the practical in school work. Farmers and educators together have entered upon the development of rural schools, as to have them cover agriculture and home economics as well as the Three R's. Thus the school people are, especially championing the consolidation of rural schools, and the farmers are laying stress upon the introduction of agriculture into all rural schools. Both classes are rapidly coming to favor both propositions. The farmers are coming to see that agriculture can not be successfully introduced into the one-room rural schools, and the teachers are coming to see that agriculture and home economics

are to have very strong positions in the primary country-school curriculum alongside the Three R's.

The need of a unified system of agricultural education with rural schools, agricultural high schools and colleges of agriculture, articulated throughout as are the three classes of primary, secondary and collegiate schools devoted to the education of the city or non-agricultural classes, is gaining wide recognition. Courses of study for agriculture and for home economics covering the sixteen years of primary, secondary and collegiate work have been designed, demonstrating that a unified system of education can be built up for country people, and for the professional or technical classes needed in building up the rural industries. To develop country-life education as instruction for our city people is developed, two important changes are necessary. First, there is needed in every rural Congressional district an agricultural high school with capacity to accommodate several hundred students, and second, rural schools should be consolidated. In these two points unanimity of opinion is being slowly but surely reached by those who have paid most attention to this subject; and the next large public expenditure for education made by the American people should be for the consolidation of our rural schools, the development of agricultural high schools, and the development of industrial work in our country-life and in our city-life schools.

It is easy to believe that if a way appeared whereby the necessary funds could be provided, all would agree to these important developmental changes. Our farmers say that they cannot afford the expense of discarding the little rural schools and erecting fine central school houses and assume the additional annual expense of hauling their children to and from the consolidated school. Our States even in these prosperous times feel conservative in appropriating the money to equip each of several agricultural high schools and the money necessary for the current expense fund of each such school. Our cities and towns during the period when their development expenditures for streets, sewers, waterworks, and general school buildings are large do not feel that they can add to their budgets large items to equip and maintain instruction in mechanic arts and home economics. The States and cities argue that even if free industrial education would pay the community, its cost is more than their present financial ability will warrant.

Investigations to discover how best to finance movements to improve the condition of our farmers, our city workers, and our home-makers have led to the discovery of a fact worthy of the most serious consideration. In its early days, the country being small and jeopardized by external foes, the General Government received the right to levy indirect taxes as on imports, on alcohol and tobacco. The states and the lesser political divisions on the otherhand raise their revenues by more direct taxation as on personal property, on the incomes of corporations and of individuals and on inheritances.

It so happens that since the General Government and the State were allowed these sources of income vast economic changes have taken place, placing the Central Government greatly at an advantage as compared with all the States combined in securing taxes. With the enormous develop-

ment of manufactured products and the increased power of the people to purchase them, and with the greatly cheapened transportation resulting from the circulation of vastly greater quantities of commodities, the revenues obtained by the Federal Government have enormously increased. The States on the other hand find it impracticable to secure such large amounts of public revenue from the more direct forms of taxation. This is clearly illustrated by the fact that the Federal Government thus secures in taxes revenues amounting annually to \$800,000,000. This is \$10 per capita, or nearly \$50 per family. The States on the other hand annually bring into their State treasuries only \$2 to \$3 per capita, or about \$200,000,000. It should be observed that revenues derived by cities, counties, townships, and other political bodies make the State and local taxes presumably somewhat larger than the Federal revenue. The fact that the State legislator is often chosen under pledge to keep down State expenses, while the Federal legislator is expected to secure all he can get for his State from Federal appropriations has not a little to do with the relatively larger growth of the Federal budget.

It may be of interest to note that this centralization of revenue in the hands of the General Government is a great force in centralizing governmental power, and if the people had less education or lived in a time less democratic this vast sum secured from indirect taxation might be a fatal danger. On the other hand modern conditions require immense strength and resources at the command of political administrations which every four years must depend for their power upon the vote of the entire people. Not only the outside forces with which our Government might come in conflict, but the vast centers of financial and political influence within the country are gaining such mammoth proportions that the people as a whole agree that a strong government is required that it be more powerful than any rival external or internal.

The productive industries of the country yearly provide the \$800,000,000 which goes into the Federal treasury. If the workers were better prepared for their tasks they could easier provide still larger public funds. Since states, cities and counties and small school districts are handicapped by direct and less popular methods of taxation in securing school funds with which to pay for the expensive work of providing education in the industries it would seem legitimate to use a small part of the national budget for that purpose. Congress has thoroughly established precedent along this line by passing the agricultural college land-grant act of 1862, followed in 1890 with a direct appropriation of \$25,000 to each state for education relating to the industries of the state colleges—thus by gift forced on the people.

It has been proposed that Congress offer to each rural congressional district \$10,000 annually toward the support of an agricultural high school. In 1887 Congress gave to each state \$15,000 for agricultural experiment work, and in 1906 this amount was made \$30,000 for each state. It has recently been proposed that \$2,500 be offered by the Federal Government toward the support of a branch experiment station at each Congressional district agricultural high school.

It seems only proper to carry the suggestion one step further and suggest that Government aid should be extended also to indus-

trial education in mechanic arts and home economics in the city and town high school. Under this plan a Congressional law has been suggested under which, say, 10 cents per capita, or a total of \$8,000,000 annually might be apportioned to agricultural high schools and to city high schools. The payment of this fund from the Federal treasury could be conditioned on the State supplying the necessary lands, buildings, and equipment, and on the appropriation by the respective states of sums equal to their allotment from the General Government. The law could be made to stipulate that the Federal fund be used only for actual work in classes devoted to the industries and domestic work.

That some comprehensive scheme of financing industrial education is necessary can hardly be doubted by those acquainted with those communities most backward from an industrial standpoint as in the South and West, and in thinly settled districts as in mountainous regions.

Even Pennsylvania would receive an impulse of vast importance from a measure of this kind. Such action on the part of the Federal Government would be of untold benefit to the country people of this state. Her manufactures also would gain a new impetus from thus inaugurating throughout her high school system mechanic arts' education. Education in home economics thus made possible to every girl in the state would still further exalt home-making and motherhood in the Keystone State.

Taking round numbers from the Twelfth Census, Pennsylvania stands among the states second in manufactures only to New York. In agriculture she stands eighth. She has a total output of \$834,000,000 in the mechanical industries and \$207,000,000 in agriculture, practically four to one. She had 928,000 workers in mechanical industries and 341,000 in agriculture, practically three to one. In trade and transportation she had 454,000 workers; in professional service 103,000; and in domestic and personal service, 566,000. Of her 6,302,000 people there were of school age 2,031,000, or practically one in every three, half of which number, 1,084,000 were in school.

The figures are not available to show the school expenditure for the five classes respectively. It is conservative to estimate that the 103,000 professional workers have had school facilities from public funds and from private endowments equal to those provided to several times as many workers in the industries. Educators are rightfully urging that more money be supplied to equip the colleges and universities which devote their energies mainly to educating people for the professions. Indirectly by training teachers for the lower schools these higher institutions of learning have a very large influence in educating the workers. Colleges and universities have had their great day of promotion, and they have reached a point where their very substantial equipment and liberal support are assured. The professional class is about 5 per cent. of the whole number of workers. In education they appear as a privileged class. They should not be given less, but more; but the great movement now needed is to give of the world's rapidly accumulating store of technical knowledge to the workers and to add to this knowledge skill. There is now no line of work for which a technique is not being rapidly developed. In agriculture, in the mechanical industries, and in home economics the body of accumulating scien-

tific, artisan, and art knowledge is being reduced to pedagogical form. Studies in this great triumvirate of practical affairs (mechanic arts, agriculture and domestic economy) are forcing in beside the Three R's, and the resulting sextette will so broaden out the knowledge, the industrial skill, and the productive and home-making efficiency of the whole people that every class will have a richer world to live in.

Pennsylvania has about one-fourth of her industrial workers engaged in agricultural pursuits with three-fourths in manufacturing and mechanical pursuits and in transportation. If Pennsylvania were provided with a fund from the Federal treasury equal to 10 cents per capita of the entire population, and one-fourth of it were put into technical education in agricultural high schools and three-fourths into technical education in city schools, and the state were required to expend an equal amount along these lines, the evolution of agricultural and mechanical trades and industries would be rapid, and the results to Pennsylvania's income and civilization would be both extensive and profoundly beneficial.

Mechanic arts' education thus extensively supported would result in much stronger leadership in the engineering professions and in the business management of Pennsylvania's industrial and transportation enterprises. Every boy in the state with strong instincts along any of these lines would then have the opportunity of the largest development of which his nature is capable. Ten agricultural high schools in the state, each provided with \$15,000 from an outside source, and \$15,000 from the state would send to the agricultural college course at State College, splendidly prepared, all the men the state needs to train in collegiate courses for professional work in its agriculture with a surplus for national service along this line.

These schools should graduate from high school courses a thousand of the farm youth every year or 35,000 every generation. Who will doubt that such a body of people trained in rural business and country home-making would not push Pennsylvania agriculture to altitudes not yet dreamed of? Would such an army of people trained in country-life education stop short of a splendidly organized system of a thousand consolidated rural schools and as many well-developed single-room schools in isolated mountain districts? From this body of young people what a splendid corps of teachers could be provided to install country-life education in these rural schools.

Under this plan a city of 100,000 population would receive \$10,000 to which it would add at least an equal amount to be used in studies in the mechanic arts and in the household industries. Thus the city schools of Pennsylvania would not only grade up the efficiency of the industrial workers and home-makers, but would send to the mechanic arts' collegiate courses in State College, or at the University of Pennsylvania and other colleges offering engineering courses, young men better self-selected and better trained to go forward in their preparation for the engineering professions. Even the other collegiate courses of these institutions would be benefited by having a better selection of youth to enter the collegiate, scientific, literary, theological and related courses of study. Besides our modern conditions require that the scientist, the writer and the theologian know the prac-

tical sides of the lives of the people for whom they experiment, write and preach.

With large public funds thus provided for the practical in education, the less expensive but hardly less important line of education in home economics would receive the impetus it so richly deserves. No one who has had an intimate acquaintance with the developments of this line of education during the past twenty years will doubt the assertion that 10 per cent. of the large sums of money suggested for industrial education if applied to instruction in home economics in all the public secondary schools as thus suggested for city and country would easily bring back to the people more than the entire cost.

While Congress inaugurated industrial education; while Minnesota has the credit of designing a successful course of agricultural high-school work; while a number of our cities as Philadelphia, Brooklyn, St. Paul, St. Louis, Chicago and Menominee, have proven mechanic arts' high schools to be practicable; and while Ohio, Indiana, and other states have made practicable that most difficult of changes the consolidation of the rural schools; and while Alabama has the credit of being first to locate an agricultural high school in each Congressional district the great Southern state of Georgia has the proud distinction of first proceeding to finance a system of agricultural high schools throughout the state. Last July the legislature of Georgia passed an act authorizing Governor Terrell to locate an agricultural high school in each of the eleven Congressional districts of the state, and turned over the funds reserved as tag taxes on fertilizers and oils for their use as an annual support fund. The act required the people of the respective districts to furnish farms, buildings and equipments. Governor Terrell secured experts to aid in the selection of farms suitable for school and branch experiment station work. He employed an architect to prepare a bird's-eye view of campus and buildings, and he called upon educators who aided in devising a course of study devoted especially to agriculture and home economics, and articulating with the rural schools below, and with the farm, and at the same time leading toward the collegiate agricultural course in the University of Georgia.

The people of Georgia were thus so fully aroused to the importance of these schools that the bids of different cities and counties for them reached figures which put our rich Northern states in the shade. All but one of the eleven schools have been located, and what will be the bid of the last one is pretty well known. The total thus given almost wholly by individual subscribers for the 200 or 300-acre farms for buildings and equipments amounts to over \$800,000—more than \$70,000 with which to equip each school.

Is it any wonder that this magnificent response by the people of Georgia to his appeal to thus use modern technical education to bring still higher her rising industries and home-making led Governor Terrell to suggest to his Congressmen to secure a Federal grant for more money with which to supply to these schools and for a branch experiment station at each school a more nearly adequate annual expense fund?

America has no state more able than Pennsylvania to make a strong pace in the development of industrial education. Building up a system of education in the city industries, in agriculture and in home-making will cost additional funds. But the

expenditures to make more efficient the producers of wealth and the home-makers who devote themselves largely to the development of people will pay back their cost several times over. Our statesmen and our educators have before them no more important problem than that of financing a plan of industrial education which is educationally correct. More experiments are needed that we may know how to develop industrial education. Of especial importance are experiments to determine how best to organize education in agriculture and home economics in consolidated schools. Pennsylvania's law passed several years ago providing for the consolidation of rural schools should furnish excellent conditions for such experiments. The rural school being far the most important of all schools devoted to country life should be studied by actual experiments. No other one object in agriculture is so much in need of investigation. Possibly legislative bodies and men in practical affairs must make the first move, as in the creation of agricultural colleges and as in financing agricultural high schools.

Mr. Chairman, I think I have talked too long. I am glad to be here and see the faces of men like your Secretary, Mr. Critchfield, whom I have just met, and of Dr. Armsby in whose class I used to be when I went to college (not that I mean to imply that he is old), and of Dr. Hunt, the man among all other men best fitted to the position to which he was called. I should like to say more about these people, but I have already talked too long, and I thank you for your attention.

President Norton: Are there any questions to ask Mr. Hays?

Secretary Bayard: There are a number of plates of corn out there that we have no means of identifying. I think there are seventeen or eighteen specimens that have no identification whatever. I take it that the owners will know their corn, and wish they would identify it for us. We carefully made a record of every exhibit and then took off the cards when considering the corn in reference to the award of prizes, but I wish the people who have not handed in their cards would see me about it.

There are gentlemen here who are looking for Holstein cattle, and others who are looking for Guernseys. If the people who have these cattle to sell will see me, I will point out these gentlemen to them.

President Norton: The time has come for the demonstration of the milking machine, but we will not start it while Mr. Van Alstyne is talking. I wish no one would leave the room until he is through. It will be operated tomorrow at nine in the morning, half past four in the afternoon, and ten at night.

Tomorrow morning at the meeting of the Live Stock Breeders' Association, we will have an address by Mr. Alva Agee instead of the first paper.

The Creamery people are especially invited to the meeting of the Dairy Union, which will be held in the Education Department of the New Capitol—in Dr. Schaeffer's room. They will have butter-scoring demonstrations for the benefit of those interested in the making of butter.

We will now listen to Mr. Van Alstyne on "Rational Feeding."

RATIONAL FEEDING

Address of Edward Van Alstyne, Kinderhook, N. Y.

Mr. Chairman and friends: If anybody wants to go out, I will not be offended, because I think it is a shame to inflict another speech on this audience when it is nearly ten o'clock, but the Chairman has insisted on my speaking, so I shall have to do so.

I want to lay down three general propositions on the subject of feeding, and a great deal of what I say will be along the foundation which Mr. Fuller laid this afternoon. Some of you gentlemen have probably found out for yourselves much of what I am going to tell you, but it is those who have not progressed along the line of feeding as they perhaps should have done, that I want to help if I can, and the others of you will have to bear with me.

Our general purpose in feeding animals is to keep them in good condition. I want to make that emphatic, because from some things I expect to say you may infer that I would underfeed. I want, therefore to say first of all that we must keep the animal in good condition. She must be kept so for herself, and for our good.

To illustrate, take the matter of summer feed. If we allow, as we often do, the cow to run down in flesh during the summer, she will never do as well again until she builds up her system once more.

Then, do you believe in adding grain to the pasture? Now, my position on that point is just this: I am fully satisfied in my own mind that if we can add our forage crop to the pasture so as to keep her up in flesh and milk, we do not need to feed the grain. But even if in supplementing the pasture we keep up the milk flow, but lose flesh, it is better to feed grain, even if we do not get profit on our grain for the time being.

To illustrate—I speak of my own work, because I am more familiar with it than with any one else's—last year we did not feed grain during the summer, and along about September I noticed that my cows had lost flesh. There was no question about that; then I began to feed grain, and, friends, before the pasture of the next year, I know that I fed two fold more grain than I would have done if I had fed a little grain during the summer.

The next proposition I make is this: that there is a difference between feeding cattle for profit, and feeding them for production. "What" you say, "when you feed for profit, don't you feed for production?" Why, certainly not. Take, for instance, the Pan-American Dairy Tests. The people who had charge of the Holsteins and Ayrshires fed them from 16 to 18 pounds of grain every day in addition to plenty of good silage; and then they pointed with pride to the record of their cows, but at the end of the week, when the cost of their feed was taken from the value of this production, instead of standing at the head they went down fourth or fifth, and the second week was a repetition of the first. Then they saw they had to do something, so they gradually reduced the grain rations to 10 or 12 pounds, and at the end of the third week they had more profit on less milk and less feed.

I don't know how it is in Pennsylvania, but in New York, since the doctrine of pro-

tein has been preached, our folks find that they get more milk for the same amount of feed. In many cases the question with the farmer has only been "how many cans of milk can I carry away today?" They do not stop to think that they are carrying away the milk and carrying home the feed. When their check comes, the most of it has gone to pay the feed dealer and little left to pay the interest on the mortgage or buy shoes for the babies. They are feeding for production and not for profit.

Now, as to the character of the feed for our animals. Let us then proceed to the subject of the chart.

First, the green feeds, because they are the best, at the head.

Next, the dry fodders, feeds that are grown on the farms. It seems to me that one of the objects in keeping a dairy cow is to turn some of the raw, crude, cheap material, through the medium of the dairy cow into the finished product, and for that purpose it seems to me what we should use as much of our home product as possible.

Every farmer knows that the best feed to give his cows to make them produce milk is pasture grass, and if you will notice pasture grass is 80 per cent. water. Now, if you will put that cow into the stable, she will eat between 80 and 100 pounds of it, and do very well on that alone, and after you have satisfied yourself on that point, take this same grass and dry it and where you had a hundred pounds you have eighteen or twenty-five; now, you will take this same feed and give it to her with all the water she can drink and what will happen? She will get thin and dry up.

Now, we want that cow to be in a healthy condition in the winter, and if we have not the pasture grass on which she thrives, we can give her some other succulent feed. You will find here a line of green feeds, three-fourths of them water. You will notice, also, that the dried foods instead of having 75 per cent. water have less than one-fifth, and as the water is decreased the crude fibre is increased, and instead of 10 per cent. of it we have over 40 per cent.

In the dried stalks much of the starch and sugar which in green corn was digestible are tissue in woody fibre. So you will find roots which are 90 per cent. water. Any breeder of sheep will tell you that he will get more growth from less grain if he feeds roots.

What about the protein? It is necessary in these days to understand such terms as "protein" and "carbohydrates" and "potassium," and other words that were mentioned this afternoon. Well, we have learned to take them in as we have such words as "auto-car" and several more of these terms.

The protein is the element in the feed that makes the lean meat and the blood. If there is any man who does not understand this, I want to make it clear, if possible. This element in the food will do all this; it will make the lean meat and the blood, and you can't get it without it. The man who feeds it is building up the bone and muscle, but most of the feeds grown on our farms are deficient in it. Prof. Hayward has told us what he knows about growing the pig, and that he has to have a good deal of protein with his rations.

Now, we have a young heifer and we expect her to make a success as a cow, so we must give her the material to build up her body on, and she can't get it out of the starch and sugar in the feed.

Then we have the dry corn and there is where I think the farmer is making a mistake. Perhaps she is within a few months of calving and we don't expect her to give us much milk, so we do not feed her protein, but put her on coarse feed and fail to take into consideration the effect it will have in the development of that calf. Take a case of abortion at about seven months; most of them occur about that time, and I believe that many of them are due to the fact that she did not receive the necessary food element to produce the strength necessary to bear that calf. Unless she is properly fed, she will have to take from her own body to develop that calf and probably fall off in flesh. Now, I would not feed that cow during the last few months of pregnancy the same concentrated foods as when she is in full milk, but I would give her the cooling protein feeds that would give her the strength she needed. I have heard people talk as though there was no benefit in carbohydrates. Why, certainly there is; but the point is, we have most of them in our own feeds, and with this in view how can we bring it down so as to benefit us in a practical and economical manner.

What do we feed in the winter when we have no pasture grass? Well, we have the silage, which is succulent but deficient in this protein. I value my reputation, but I will stake it on this proposition: I will undertake to keep my cattle in as good condition on the silage, and get as much milk as on the dry stalks and two pounds of grain daily in addition. What does that mean? That I am to that extent free from tribute to the grain dealer.

While we are talking of silage, let me finish it up. The corn that we feed our dairy cows can be most economically fed in the form of silage, and I am satisfied that the corn is worth as much pound for pound in silage as it is in meal. In my country it costs about one-tenth to husk the corn, and we have to give the miller about one-tenth to grind it for us. There is one-fifth of the value of our crop. Furthermore, I believe if we add so much corn to our silage that our gutters are full of the corn it is a waste and an injury to the cow.

Now, if we go and eat a big dinner and on it go and eat a big piece of mince pie, see what happens. The same thing happens to the cow. I claim that if we feed our cow more than she can digest, it is a positive injury. I have fed the cows lots of good corn meal that was not necessary, and both the cows and I lost by it. I believe that not more than sixty bushels of corn per acre is as much as we can safely put into silage, when we give the cows all the silage they will eat twice a day. But when we have all the corn we need in the silage, it does not pay to add corn to it in feeding. Then what are we going to feed with it? We must give that cow more protein, but where are we going to get it? Perhaps we have the corn stalks, which are high in fibre and heat forming elements but not rich in protein. We do not get it in the corn stalks, nor in the silage, nor in the corn meal, and I want to feed all I can of these because they are grown on the farm and are cheaper.

But they are deficient in protein, so there is a limit to the amount we can feed.

Now, I keep a book into which I enter month by month, on one page the returns of my dairy, and on the opposite page the cost of the feed and I am much pleased with the results of my dairy until I turn the leaf and add up the cost of the feed, and subtract that from the returns of my dairy; then I don't feel quite so good. Perhaps you do the same, and I want to see whether we cannot learn to keep that cow a little more economically from the stuff that grows on the farm.

Well, then, we will take the clover, nearly three times as high in protein as the corn stalk, and nearly three times as high as the timothy. Now, my friend Wing is here from Ohio to preach the doctrine of alfalfa, and I am glad, because there is about eleven pounds of protein to the hundred pounds—nearly twice the amount as in the clover.

Take next the cheaper grades of bran and middlings which are upon the market. I agree with Mr. Fuller that the standard of bran and middlings has been raised the past few years. If you will cut your hay when the plant is half in bloom, you will get as much value out of it as from the hay that is allowed to reach full maturity with a pound of grain per day added. I will stake my reputation on that. You see that I am not recommending anything that will cost a big outlay of money on the part of the average farmer.

Now, what next? We take the Canada pea. I consider it superior to the clover, and next to the alfalfa as an economical milk producer. About two bushels of peas and one of oats makes a good mixture. But when the oat head is forming and the peas are in blossom, what next? Oats. I know of no feed that will put more stamina into cattle than oats will. They will not produce any more milk, but they will stay longer than wheat bran.

What next? Buckwheat middlings; very little fibre, but very rich in protein and very rich in fat. Where you are making butter in large quantities it has a tendency to make a soft butter.

Now, we have got through the list of farm products, but we must have more protein; so what shall we do? Usually we shall have to go out and buy. A man said to me some time ago, "What is your balanced ration?" I said to him "I have not got any balanced ration," I am going to buy where I can get the greatest amount of food value for my money. I have been a great stickler for wheat feed, and I have said frequently, because I believe it, that a large portion of our rations should be bran or middlings because it makes bone. I know now that bran and middlings are not necessary for the cow, and how do I know it? I have eliminated it largely from my list for the last two years, and my cows are just as healthy as they were before. When a man asks me over \$20 for bran, and I can for that money get something that has more protein, I tell him to keep his bran and I will keep my money. What about bone material? If the food is deficient in it, feed a couple spoons full of bone meal daily. I find that malt sprouts and brewery grains, which are made from barley, will not hurt the cattle in the least; and these by-products of the brewery are cheaper and better than a like amount of the wheat feeds at the same money.

I don't buy the starch by-products and I need more protein, so what am I going to buy? I don't want to buy crude fibre, and if in some of these mixed feeds, when a man comes to buy them, he finds he is feeding—What did the Professor say this afternoon—twenty per cent? I think one of them ran up to fifty per cent. of it, and it is not a notion, but, friends, some of these feeds are sixty per cent. fibre. But I must have more protein, and I will buy where I can get the most digestible material for the least amount of money. I don't know what it will be next year, but I know what it is this year, the brewers' grains and distiller's grains. A car-load of brewer's grain contains twice the amount of the protein and fat as bran; it may not be quite as digestible.

Cottonseed meal at \$30 is not dear when we think it has forty per cent. of protein and ten per cent. of fat. Of course we can't feed that in excessive quantities, but a couple of pounds a day may be fed with profit.

I find I can get as much milk out of a ton of twenty per cent. gluten as I can out of a ton of cottonseed meal, but if I feed the gluten exclusively my cows will get thin. Then the linseed meal, very rich in protein and very economical. Prof. Fuller told us this afternoon that some of the stock feeds on the market sold as high as \$160 per ton, and are composed chiefly of linseed meal at \$32 per ton. I have never seen the man who denied it, but then, they tell you it is mixed with several expensive drugs. Well, if you want to feed it, I will guarantee this to be as good as the drugs they use: 100 pounds linseed meal, 5 pounds powdered charcoal, 5 pounds Epsom salts, 5 pounds common salt, 4 pounds saltpetre (which they call nitrate of potassium and we don't recognize it), 3 pounds fenugreek.

You can see how very expensive these things are, and I would say that if the animal is well, I would not give her any of them.

Well, friends, there is rational feeding. Now, how much will you feed? Why, we will feed all the animal needs to keep her in good condition and in addition to the coarse feeds she has, just as much grain as she will pay a profit on. That depends a good deal on the cow, a good deal on what you are getting for the milk. If you are getting four cents for it, you can feed better than on three cents. It is not "How much milk can I carry away," but "how much have I left for myself?" That is, over and above cost. I think it can safely be put down that eight pounds of grain in addition to the silage and good hay is as much as the average herd will pay a profit on for a daily ration.

But, you ask me, will that ration balance?

I don't care a hill of beans whether it balances or not. I have quit sitting up nights figuring on that.

Now I am going to ask the old cow whether that ration was balanced or not. "How," you will ask? I put my hands on her skin; if that is soft and oily as it is in summer, when she has pasture grass, she is all right, but if it is coarse and rough, then we put in more protein. Then, her droppings I consider a very important indication. If they are too hard, I would feed her more linseed as a laxative and if they are too soft, some cottonseed meal, and I don't care whether it balances from one to four, or from one to seven, it is all right.

And again, there is a difference in the cows. I find that the Holstein will take a wider ration with more of the heating elements than the Jersey. Again, I find that it depends upon the way the cow is kept. A cow that is kept very cold needs more heating feed. You go out here on the Pennsylvania railroad some day when it is very cold, and you will find that the train is losing time, and the conductor will tell you, if you ask him, that it can't get up steam; the trolley car is making its usual time in the same weather because its power engine is under cover.

We want to calculate by weight and not by quart, and first we must feed that cow so as to keep her in good condition; next, we will feed her for profit and not for production. We will give her the succulent silage, then we will follow with the alfalfa; then we will feed her the coarse feeds we have and to give our animals what they need of protein, we will depend on oats, peas, and home-grown feeds, and when we need to buy, we will buy where we can get the greater amount of protein for the least amount of money, because the cow will be the better for it, and then we will feed her as much as she needs to keep her in good condition and that will be rational feeding.

Nine a. m., Thursday morning, January 24th, 1907. The convention came to order with Mr. Norton in the Chair.

President Norton: The first thing on the program this morning is the Secretary's report.

Secretary Bayard: I have no special report to make. You will find the proceedings of last year on the desk, where you can get them, and see for yourselves what has been done. We have not got our corn awards arranged yet, but we will do better next year, and get more money for it.

President Norton: We will now have the Treasurer's report.

REPORT OF J. F. LANTZ, TREASURER

REPORT OF J. F. LANTZ, TREASURER.

Mr. Chairman and Gentlemen: I am not going to give you a written report this morning, owing to the fact that when I write a report I am very likely to go to too great a length, and as we have a very good program I will make my report very brief. I wish to say that this Association has no salaried officers, and at times the officers have had to reach down into their pockets to meet the necessary expenses. And so, when we wanted a good report

printed, and had no money to pay for it, "The National Stockman and Farmer" printed it for us free of charge. The officers have always paid their own postage, in addition to furnishing the stationery and doing the work.

Now, this year we would like to get out a good report, and all those of you who are not members of the Association we shall be glad to list as non-members, if you will help us along by giving us a dollar, and we will send you the report which will be

worth more to you than that dollar.

I will now give you the actual report in figures, which is as follows:

Balance on hand.....	\$ 64.11
Annual dues received.....	115.00
Department of Agriculture.....	225.00
Advertisements in "Annual".....	58.00
Received from Dairy Union in payment of their share of expenses of last Annual Joint Meeting.....	144.21
Total	\$606.32

EXPENDITURES.

Bills paid Lecturers at last Annual Meeting	\$265.69
Stenographer	65.00
Printing Annual, Postage Programs and printed matter to members.....	42.47
Total	\$523.16

Balance on hand \$ 83.16
President Norton: Are there any remarks on this report?

Mr. McSparran: Is there a Committee on Resolutions? I think that since "The National Stockman and Farmer" has been doing our work for nothing, we ought to extend them a vote of thanks.

Secretary Bayard: "The National Stockman and Farmer" has been thanked for it. That was done last year.

President Norton: I will say that I expect to appoint a Committee on Resolutions, also an Auditing Committee a little later, and any one who has any resolutions to offer will please reduce them to writing, when they will be presented to the Committee and brought before the house. We want to proceed with the program now, so I will appoint these committees a little later.

Dr. Hunt: Mr. Chairman, I have an announcement to make to you this morning, that I think you will be glad to hear.

Pennsylvania State College as a farming institution has three objects in view; one is, to obtain knowledge relating to the industry of Agriculture and to make experiment and research; another is to educate young men and women to go out into the world and carry out instruction; and the third, to extend to the citizens of the state, to farmers and others, the knowledge which we may gain at the Experiment Station. When we find out anything that will be of benefit to you, we don't want to keep it under a half-bushel, but we want to get it out among you, where it will do some good. Now, the Board of Trustees for a number of years have been endeavoring to bring about such agencies as will bring the School of Agriculture and the Experiment Station in touch with those who need it, and them in touch with it in a practical way, and for a couple of years they have been endeavoring to get a man—the man, and the only man that they thought ought to be in that position. If you did not know him so well I might say something about him, but you know him too well for me to be able to add anything to his qualifications. I could not do that if I were to try, so I will only say that this is the young man that the Board of Trustees has selected for the work, and he is to become Professor of Extension Work. I take pleasure in introducing to you Professor Alva Agee.

Prof. Agee: Mr. Chairman, Ladies and Gentlemen: As you have already learned, Dr. Hunt is a very taking man.

I am glad to meet the Live Stock Breeders' Association of Pennsylvania. Last week

I addressed a meeting of the National Breeders' Association at Columbus, Ohio, and it was a great meeting. There was gathered there a large number of men, like you, practical breeders and men interested in heredity. If there was any criticism at all to be made of last week's work, it was that the program was too full. There were too many good things to digest. And I congratulate you on your program—a program that will be a benefit to all who are here. Over there I was just a little bit uneasy for fear the large mass of facts would cause distress to some of us. I thought of the young married man whose wife woke him in the night, saying she had been listening, and she was sure she heard some one in the pantry at the pies she had made, and he said he didn't care, so long as he didn't die on the premises. I enjoyed that meeting over there very much, and here I have been delighted with some of the best meetings during the last three days that I have ever seen in the State of Pennsylvania. Now, I don't know very much about live stock breeding, but I am willing to take the information you give me and extend it to others. I am like a friend of mine, who, like most of us, believes thoroughly in our President. One day some one asked him whether he believed in infant damnation, and he said "Why—I don't know; what does 'Teddy' say on that point?" and so I am in the same boat. Whatever you people say I am willing to spread abroad, and whatever I say or think this morning, does not concern the program at all.

Some of your people have been interested in our Farmers' Institutes, and in our Department of Agriculture, believing they were effectual in reaching the people with the facts that have been developed by research and work at our Experiment Station, and above all, have been interested in the education of our young men. We have talked college education with our neighbors; some of us have said "these boys must go to our Agricultural College and take a four years' course in Agriculture before they are fitted to become land owners." Now, we are all practical people here this morning, and to us that sounds good, but it is a fact that ninety-five out of every hundred who will own land in Pennsylvania, and Ohio, and New York, and in our great agricultural states in the next quarter of a century will not be men who are able to spend four years in an Agricultural College. Some of these boys of ours are not students. I mean by that that they are not book men, they are not boys who are willing to spend four long years in the class room; they prefer to work on the land. That means this, then: these boys who will be the land owners in the next quarter of a century will not know how to farm intelligently unless we can reach them in some way; they will not know any law that governs any plant or animal. Well, some of us have said that the solution to that problem lies in teaching agriculture in our public schools. Now, I am heartily in accord with that. I agree with Director Bailey of Cornell in what he says about teaching geography; most any man does agree with what he says about teaching the kind of geography to a class of boys that concerns them most—and that is the geography of the farm. You take the average boy and ask him "How many fields are there on your father's farm?" He will say "it is 10x12—I don't know; I'll ask father." Father don't know, and he comes in the next day with a new idea. Then we

ask him "What is the distance from your residence to the farthest field on your farm?" and then he would measure it, and find out how much time was lost in tilling that field. Then we ask him about the soil, and the plants, and the animals, and I tell you, we are practical men, and within the next quarter of a century we will not need in that neighborhood a college to teach our boys properly in agriculture. But what are we going to do now? How solve the problem before us?

Last Monday and Tuesday of this week, I spent a four-hour school day at the Ohio State University, with 136 of our Ohio boys who go up to that institution to take a ten weeks' course in winter instruction. We take some of these young men who are absolutely ignorant of any law that governs plant or animal life, and we put them in with some of the boys in the four-year college course, and we give them instructions on plants and animals and soils, and teach them to judge specimens of live stock, and we bring them into contact with the practical elements in agriculture. They do not learn much in these ten weeks, but they will be largely benefited. They will see that Agriculture has a wider outlook than most men make it. That has been done in Ohio. We are going to do it at Pennsylvania State College. It is already being done in Iowa,

Illinois and Minnesota.

If you will permit me to be personal, I will say that up to a few weeks ago, I thought it would be utterly impossible to convince me that I had other work to do than the work I have been doing, and that interested me. When other matters were presented to me at one time in Ohio the past few years, I said "No, sir; I am perfectly satisfied; I don't want anything better than I have here," but when I realized the possibilities in Pennsylvania of bringing your boys to our State College, where there is a fine corps of scientists at work—when I realized the possibility of bringing these boys who are going to make their living in a few years to our State College for ten weeks, and starting them right, I was very easily tempted. I know it is no easy work; I know it is difficult work, even with the co-operation of men who believe like me, in a better agriculture. It would be even more difficult if I did not believe that men like you are working with us and upholding us—working in harmony with Dr. Hunt and the Trustees of the College—with all of them. But we are going into the work, knowing we have an ally that will strengthen us where we are weak, and that these boys will come to State College within the next few years for the benefit of agriculture, and of your grand Commonwealth.

PENNSYLVANIA STOCKMEN AND THE MEAT INSPECTION LAW

By Dr. Thomas F. Hunt, Penna. State College

Mr. Chairman, Ladies and Gentlemen: Eight years ago I stood one Sunday on the Great Salt Air Bathing Pavilion at Salt Lake City, and looked over that broad stretch of country, and I thought of Dickens' remark that that he did not know anything deadlier than a door nail except a coffin nail. He could not have stood where I did, and looked over that vast stretch of country without a sign of living vegetation, and standing there, looking over that broad stretch of dead country, you can judge my surprise when I found later that that broad area of dead land of which I am speaking was once laid out in fertile farms that were the pride of the early settlers of Salt Lake City. But the vegetation failed through lack of irrigation in that land of the alkali, wherein no living thing can flourish without it, and the farmer moved off. Now, that is a particularly striking illustration, and I use it to show you the foes that have surrounded the alkali sections of the United States.

Then, I took the train for San Francisco, and if you read the glowing account of the railroad circulars, you will expect to find yourself at once in the beautiful valley of the Sierra Nevada; they give you a fine description of it, but they fail to say anything about the two nights and days you must spend in traveling through the alkali desert where the alkali dust almost chokes you, and there is no sign of any living thing.

Well, the next morning I got up, and I asked "What state is this?" and they said "It is Utah;" I said "Why, I thought I was in California by this time," and they said "No, this is Utah yet." Then I asked them "Is not this the trail of the Forty-niner?" They told me it was, and looking over that vast expanse of desert, where there is no living thing, I said "but how could he get through here alive?" He had horses, for there were no trains, and he could not travel

on foot all that distance, and supplies must be taken along; and probably he had his family with him. How could he ever get across this desert? There is nothing to support animal life, and no living plant or tree. Well, the rest of the passengers were tenderfoots like myself, and no one could answer that question. The conductor could not enlighten me, but finally a man who said he was an engineer, and had engineered all through that country said, "I can explain that to you." He said "when the Forty-niner went over there the grass was knee deep. These were the sheep pastures of Nevada, right along here, where we are now running." (Mr. Wing was there and can tell you whether or not I am right; this is the engineer's history, and I don't know whether I am right). He said, in the first place came the cattle man, and got possession of the land when the grass was knee high, selecting the places where there was grass there and water there was all the title required so far as he was concerned, and the next cattle man who came along took the same thing. Now, he had the cattle, but he did not figure on the sheepman. Then he came along and I have been told by men out there that the sheep can go thirty days without water, and I do know that the sheep can get ahead of the cattle on the water proposition. And no cattle will follow sheep in large numbers. Then, he said, it rains some times out here, and you people who have not lived here know nothing about this adobe mud; it is worse than anything you ever saw. The sheep you know, not only eats the grass like cattle, but he will burrow down and pull out the roots, and they pulled out the roots of the grass and trod down this adobe mud so hard that where there was grass knee high in the days of the Forty-niner, there is now neither grass, nettle, nor jack rabbits. So

I began to notice more particularly. I had supposed that this country, this one-third of the United States west of Denver, was a be the feeding place of the whole United States, that we were to go there and get our young cattle and bring them east. That was what I supposed eight years ago, but when I looked at it, it looked different. I can bring it home to you. Let me give you a few illustrations to call it to your attention.

What is contained in the state of Nevada? I went up to Carson Lake and took the stage down to Carson City. Along the stage line I saw a "V" shaped box, and in that box was running water. I kept looking at it and wondering what it was. Finally I summoned up courage enough to ask the only other passenger on board, who was a woman, what it was. "Why," she said, "this is a flume." I said "What is a flume?" "Why," she said, "that flume brought down wood from the mountains to the box factory at Carson City." "Oh," I said, "there is a box factory at Carson City?" "No," she said, "there is none there now." I said "Why not?" I suppose she thought by that time I was a fool, but she said "We have no wood." I was afraid to ask her any more, so I kept on looking and at Reno, Nevada, I asked a man why it was that there was no lumber in that part of the state, and he told me that Mackay, the lumber king, had over two hundred and fifty men at work up there day after day for more than four years cutting that wood. I went up to Reno by train. The train stopped; I have never learned why it stopped, because I didn't see any house. So I said "What is this place?" They said it used to be a mining town of two thousand inhabitants, but it is all gone now. There is no wood, no tree, no vegetation there, and so they have gone. Now you can see why it is that Nevada, several times the size of the state of Pennsylvania has a population about the size of this city of Harrisburg, and it was less in population in 1900 than it was in 1890. I am not saying this to disparage any one, but I only want to bring home to you this proposition. As a matter of fact, that trip made an easterner of me, and set my feet in the opposite direction, when I came to look at the surrounding country. I had gone West with the intention of staying there, but I came back East, after I had gone over that country determined to stay East.

A little over a century ago men began to go over the Alleghany mountains into the new country beyond. Then, from 1800 to 1850, they spread into Ohio and Kentucky, and perhaps Illinois, and they flourished at your expense. Why? For two reasons; one was that it was a new country, fresh and undeveloped, and your young blood went out to develop it. Then came the Civil war, and after that was over the stream crossed the Mississippi. Heretofore the people of the United States had dug out their homes from the forest; then they came out with plows, and turned a furrow or two and made a home; then came the self-binder, and then other improved farm machinery, making it easy to make a home, and from 1870 to 1900 the population of the United States doubled, and in these thirty years the agricultural industry developed.

What does that mean? Why, it means that in thirty years these people of the United States were compelled to produce as much as they had done in 250 years before. For one hundred years these people out there have been competing with you because they

have had cheap lands with fresh soil, and because they had your fresh young blood to develop it, and they raised cattle out there at practically no cost whatever. Take the illustration I have frequently used of the Jew peddler who went to Deadwood thirty years ago, and distributed a few cattle on the public land there. A few years later he had 20,000 and then 300,000 of cattle worth \$3,000,000, every dollar of which he made by distributing cattle on government lands. It was easy for these people to ship cattle into this new country, take them off the train and distribute them on that land, and then ship them back at \$2 a head, you, of course, to stand the loss. I spoke to a Westerner about raising cattle in the East, and he laughed at me, and said "You go back and teach those Eastern farmers to make Jersey cream."

Now here, gentlemen, is this proposition; this Eastern country is adapted to the raising of trees and grass; the Western country is adapted to the raising of corn cheaper and cereals. Then we have between the great central West, between Pittsburgh and Denver. And when proper economic conditions are developed regarding the raising of grass and trees, and the cutting down of the trees is stopped, the tree and grass men in the North Atlantic states must flourish. Pennsylvania and New York will make great horticultural states, because they have the trees, and the time is coming very rapidly, I believe, when this will be the cattle producing country, and the West be better adapted to doing some other thing—not that it is not a good country; I would not say anything against that part of the country—but it is better adapted to doing other things, and we need not send our young blood out there to develop it. It has got to be developed at its own expense. You have been doing that for a hundred years. You could not help it. No one could. For the last hundred years they have raised stock so cheaply that you could not compete with them. Some of you have not had stock enough to keep up the fertility of your land, but just as soon as you have more stock on your land you will raise more corn and more wheat, and you can afford to keep more stock because you are going to be paid better than you have been. Some of the people here have thought that the only thing that is going to continue in live stock is raising milk and butter and shipping it to city markets; that the meat business is out of it. Now, the fact is that these Eastern states are better adapted for raising meat stock than they are for dairy stock. They are better adapted to raising grass than cereals. In Nebraska there are 32,000 hand separators; out there where you have been thinking of them only as raising steers they are milking cows, and sending their milk in some instances five hundred miles to be made into butter. Three creameries in the state make ninety per cent. of the butter made in that state. You have competition in dairying, and there is coming about a re-adjustment of the live stock conditions of this country.

Now, there is one other thing I want to call your attention to; some one has referred to what "Teddy" thinks, and this brings home to me that they have been quite busy in Washington lately. They have passed two very important laws. In my mind they are more important than most people realize. They have passed the National Pure Food Law, and they have passed the Meat Inspection Law. It is going to make a difference, I think. I went into one of the big

packing houses in Chicago, and when the head man of the house showed me about, he took me to the department where they make bone handles for knives. The girl in charge showed me how they were made, and "These we make into bone handles," she said, "and" showing me some other, "those made in this way are the imitation stag horn, and those," showing me a third lot, "are real stag horn." The girl was perfectly honest in her endeavor to make things plain to me. Now, the other day I bought this knife of a perfectly honest young man as genuine stag horn. Now, it does not make any difference to me whether I carry a knife with a handle of genuine stag horn or not, but it does make a difference when I eat a piece of meat whether it has poison in it or not. It makes a difference to me when I eat sausage whether I eat so many pounds of sausage, or so many pounds of potatoes, and so many pounds of water. I was told in this same packing house that there was no kind of sausage in the world that they could not supply, and I have a letter in which the enumerated sixteen kinds which they make, and many other kinds which they do not care to mention, for fear of hurting the trade. Here is the point: this is the Pennsylvania farmer's opportunity to put on the market a good article.

Now, gentlemen, you cannot buy Evaporated Cream any longer; it will be just plain Evaporated Milk. You cannot buy colored peas; if you put colored matter on the market some one will find it out, and you will be out of business. But, you say, if we put a good article on the market some one will put it out of the market. That has been the case for the last fifty years, but I believe that from now on is going to be the opportunity to raise the finer articles—a greater opportunity than ever before. I believe there is going to be a discriminating public, who will be willing to pay a good price for it if they are sure of getting the genuine article. I believe that instead of a few large packing houses—I have nothing to say against them, for they are all right in their places—but I believe that instead of a few large packing houses, there will be scattered throughout Pennsylvania small abattoirs, perhaps co-partnership abattoirs, the same as co-partnership creameries, and they will say you "Can get genuine sausage there, and can get it fresh every day and inspected" just the same as the creameries. There will be some disadvantages, but there will also be some advantages, and the bones and fertilizers instead of being shipped from Chicago will be right here, and I believe from now on is the day of the Pennsylvania farmer; you will produce more and more of the meat products; there will be less and less competition from the West, and instead of being confined to a local market there is going to be a demand for your products, and you are going to lead in producing a good article. I am not interested in cattle; you know I am looked upon as an Agronomist; I am interested in raising crops, but there is an old Flemish proverb that says "No grass, no cattle; no cattle, no manure; no manure, no crops," and this I think you will find holds true, and since they are all interwoven, I hope the Pennsylvania farmer will take hold of his opportunity, and turn his attention to the raising of cattle for the market that is sure to come for him—is coming now.

President Norton: This paper is now open for discussion.

Mr. Wing: Mr. Chairman, it does not seem to me that we should allow that splendid address to go without a little discussion, especially as it is the most vital one that has been touched upon at this meeting. The question is, Are you up against it? The time has come for the farmers in Pennsylvania and Ohio to wake up to their opportunities. For some years farming had rather fallen into disrepute in our eastern states; there was too little in it. In Ohio I have seen corn sell at 16 cents per bushel—a case of 16 to 1. But there is a better day at hand. These conditions in the West of which Prof. Hunt speaks—the disappearance of the grass out there—are all true, and more true than he has told you.

I spent a month in Colorado recently, and looked over conditions there. They saw something must be done there, and they are learning how to do things there, and how to do them well. They work harder than lower, and I saw the farm fences going down, you do here, but they have the faith to overcome the necessary obstacles, and will find a way. They have sent the price of land up in the San Luis Valley to \$175 to \$200 an acre; it is worth that now at Fort Collins. They have faith, these people. I said to them "But look at the distance from the market." They said "That is easily overcome with transportation facilities." And they said "We can raise four or five tons of alfalfa to the acre and get three crops." I said "I can do that in Ohio. What do you get for it?" They said \$5; I said "I get \$12 in Ohio." They said, "We can raise 75 bushels of wheat to the acre and some men get a hundred." We said "We can't do that but we can grow corn, and get an average of 80 bushels to the acre." And they take this to market long ways in teams, but they have faith in their future, and courage to work hard for less money than we people get here. Now, do you see why they succeed there?

Several years ago it was my privilege to go across the water. I guess I was always a pessimist. I remember when I was a boy—I was born in Ohio—and I can remember when a farmer got 11 cents for his hogs, which he had fed on his farm, and sold his steers at \$90 to \$120 a head, and once when I was a little boy, I was sent with some of them to a neighboring farmer, and when I got them there, the old man gave me a dollar. I tell you I was proud. When wheat got down to \$1.25 the farmers said, "Times are getting poor now." They kept on growing poorer and poorer, and the farmer began to average only 20 bushels to the acre and then fourteen. Then I bought a field next to ours that I had been wanting for a long time; it had got down to where I could handle it. I have that field now. But the average yield grew smaller, prices lower, and the paint wearing off the houses, and the mortgage on the farm grew greater rather than smaller, and I remember riding along in the train and seeing the old houses growing shabbier, and the old farmers getting white-headed, and I said to myself "Agriculture is doomed here; the richer west is getting richer, and the poor farmers here are getting poorer, and there is nothing left for them at all." Soon, however, times began to pick up in Ohio, and they began to pick up here, and today times are much better than they were then. But still it seemed to me that the soil was impoverished, and then I began to think of it, and it struck me that this was new soil; it could not be worn out; it had been in use less than five hun-

dred years—much less in most places—while in Europe the farmers have been farming the same soil for centuries, and are still farming it, and just about then I had the opportunity to go over to the old world, and I started in England, and then went down to the Isle of Jersey, and then over into France, and the one thing I wanted to see was how they could have lived on the land so long, and could still continue to live on it, and it was the most marvelous thing I ever saw. In France I saw the finest farms I have ever seen; the next were in Scotland, and I don't know whether Scotland was not better, even on the whole than France. But in France, where I stopped, there was an old Frenchman, who offered to take me some miles out of Paris to see a fine farm which he knew, having come from that neighborhood. So one beautiful morning we started out by train. Now, the old Frenchman could not talk any English, and I knew about three words of French, but we talked all the way. When we saw anything that did not please us, we frowned, and shook our heads, and when something particularly attractive came under our notice we smiled, and shrugged our shoulders, and we understood each other. When we got there, we went directly out into the fields, and I can assure you I have never seen a finer sight than that field presented that morning. There was the wheat as high as the backs of his oxen; one man went alongside three yoke of oxen, one man driving, and an American binder doing the work. A little beyond this was another field, and I don't think I have ever seen quite so many clovers mixed together—the Crimson Clover, and the Red Clover, and the Alsike Clover, and then the Alfalfa—some fields were alfalfa entirely. Here were men mowing with old-fashioned scythes with a short straight blade, very unlike those used in America in former days. I asked the man to let me try it, but found I could do nothing with it, although I have mowed many an hour with the long curved scythe that was used in this country. Then behind the mowers came the women, and they raked the grass together in little bunches, and tied the bunches and set them up in little shocks. Wonderful grass it was; I have never seen anything like it in my life, and the green fields and the fragrant clover; it covered maybe twenty or thirty acres and it was of marvelous growth.

The farm hands lived in little stone houses which they owned; many of them had lived on this farm all their life and their fathers before them. They did not own the land; that belonged to the farmer, but they owned their houses and did the work by the job. This was an unusually large farm, about thirty thousand acres; it had an immense barn, and I saw where the cows were pastured, and I saw where the 2,000 sheep were kept.

Up you drove through a big, wide gateway to the castle, erected centuries ago, passing the big stable where they had those wonderful cows that made the milk and cream for the Paris markets to the north end of it, which was the residence part, the residence of the man who owned the castle and the farm. He was worth probably \$13,000,000. He asked me into the house and there I found a lady that spoke English, and I spent the afternoon in going through that magnificent old castle with its fine art galleries, and elegant libraries, its collections of armor a thousand years old, in the grand old halls with the windows down to the floor; but there was one peculiarity about those

windows; every window on every side of the castle looked out on the same thing and what do you think that was? They could see the cows go out to pasture in the morning in those marvellous fields, and they could see the sheep at play in the fields beyond, but from every window they could also see a great pile of manure—the greatest pile I have ever seen; two piles, each one as big as this room, sprinkled over with some composition to deodorize it. Not a very aesthetic object, but one worth a million dollars to that old Frenchman, and I am sure that every time he looked at it he said, "How proud I am of this pile of manure; it feeds my family; it feeds my laborers, and my cattle by feeding the land; it is one of my greatest treasures."

I finally got away from these people and went out into the fields again, and pressed my foot into the soil, and it ground out rich and brittle; and I said to myself "Here is land that was old a thousand years ago, and is still more fertile than anything you have ever seen, while out in Ohio you think that new soil is worn out." And I said to myself, "Joe Wing, learn a lesson from that old Frenchman's manure pile, and go home and put it into practice on your land, and some day your land will be so much more fertile that there will be no comparison between the two."

President Norton: Any further discussion?

Dr. Pearson: It has been a great privilege to listen to these addresses of Prof. Hunt and Mr. Wing. I have for years maintained that the farmers of Pennsylvania have been oppressed by an unjustifiable spirit of depression. It is not justifiable. I used to think, like Prof. Hunt, that the West was the great cattle breeding district, and that it would for a long time to come be our source of supply, but I was impressed during a recent trip to Montana, which is one of the great cattle raising states, as to what the condition really is of the cattle breeding industry. In Minnesota which has three times the acreage of Pennsylvania they can not breed cattle and horses enough for their use. They are buying horses in Chicago and taking them West.

The good land has all been taken up in the West; there is no more good land; there is no more pasture; and the great cattle industry of the West has passed to the farmers of the East. In talking with some stockmen in Montana, I spoke of the small development of the live stock industry in that state. They said "Wait until you get to the Big Hole country; you will see there the finest horses and the best cattle you ever saw." So I waited until I got to the Big Hole Valley, and what did I find there? About 20,000 good steers, and 40,000 were distributed from the stockyards at Lancaster last year to feed on the pasture, of Lancaster county, and we don't boast of it and most people don't know of it.

In the matter of beef I think there is something we have overlooked. I think Mr. Wing will agree with me that if the Pennsylvania and Ohio farmers would raise Shorthorns they would find them a profitable investment. It costs the Western ranchman from \$10 to \$12 to produce a calf, and if our Eastern farmers were to grow Shorthorns they can usually market them in a year. If they are extra good they are retained over another year, but where the herds are retained there is very little attention paid to the calf, and the bull is sold to the morgue. And if our dairymen would grow Shorthorns,

or Herefords, and keep the beef bulls they would raise a beef quality better than that of the West. These calves are sold at \$2.50. In other words, the Eastern farmer can buy for \$2.50 what it costs the Western ranchman \$8 or \$10, or \$12 to produce. Of course, there is the calf to raise, but in some districts the skim milk comes back, and on this the calf can be raised, and I believe that we can compete successfully with the beef interest of the West if we will but keep this in view.

Then we have another interest in this state which is not always considered, and that is we are constantly purchasing and bringing to our farms the surplus fertility of the West. As Prof. Hopkins explained most of the crops that are being harvested in the West contain a large proportion of nitrogen and phosphorus, and we are buying them and getting the benefit of it, and when we raise beef we do so very often without any regard to the manure as a return.

Prof. Hunt spoke in a very interesting manner of the future of Pennsylvania as affected by the new meat inspection law. I want to call your attention to a defect in this law making an appropriation of \$3,000,000 per year for the inspection of meat for export or interstate use. The appropriation gives Pennsylvania a proportion of over \$250,000. Now, I was told by a stock breeder recently that the inspection of the large packing houses is becoming more and more

stringent. He told me that Armour's men had orders to condemn any steer was not absolutely perfect. What difference does that make? Just this: before the meat inspection law they could ship this meat anywhere, but now they dare not use it for interstate or export purposes. So they ship the steers that will not do for export trade to a firm that is doing business entirely within the state in which it is located, and cannot, therefore, be put under federal control, because it does no export or interstate business. There are a great many packing houses in Pennsylvania; under federal inspection the buyer for a firm doing export or interstate business would not take any consignment that does not fully pass requirements, but the man who does business within the state alone can do it, and does do it. So this law is not all that it is intended to be and the appropriation of \$250,000 does not touch the small fellow, and he will continue to do business in his own way unless this law of the United States government is supplemented by state meat inspection laws. The people of the United States want inspected meats, or they do not want them. If they do not want them there is no reason why the Federal government should spend \$3,000,000 a year for inspecting their meat. If they do want them it is necessary to take action in the several states, and then use the appropriations for enforcing these laws.

Mr. Wing then spoke as follows:

"THE GOLDEN HOOF"

By Joseph E. Wing, Mechanicsburg, O.

Mr. Chairman, Ladies and Gentlemen: I am glad to have an opportunity to talk to you about the sheep. It is a good subject, and we will see what we can make out of it in the time before us. Some times I write my speeches and read them, but it was very discouraging to see people grow tired before I got through, so I have given it up, and when I see that they become tired of the subject, I stop talking.

I am going to outline for you the kind of husbandry that will pay the small farmer in Pennsylvania. The kind of sheep ranching that is done in the West will not do here. There the man who has only 10,000 ewes does not count for much in the business.

Now, the man with 10,000 ewes cannot lamb until the grass grows. That will not be before May or June, and there will be more lambs born in June than in May. Of course, he has a little anxious time while the lambs are coming, but there will be a man with every thousand sheep, and besides seeing that they do not suffer from the temperature at night, and that they are protected from wet weather, they do not want to be disturbed very much during this time. After the lambs are born it is a little easier time then, but the men have the extra herd on their hands until the earliest lambs are old enough to go to market. They have to see that they do not get into the alfalfa fields, or the corn fields, and these little fellows slip through very easily. Once they get in it is very easy to see where a sheep has stood. The eastern market for the western farmer begins in August or September, but the heaviest market comes in October, November and December. We used to buy tiny little bits of fellows and take them home and feed them on alfalfa and raise them, but it is getting harder and harder to get them. I remember not so many years ago buying very nice ones at \$2.75 per hundred pounds, live

weight; this year I paid \$6.35, and I had 1,400 of them. It took some faith, and I almost thought "I can't do it."

Now, the men of Pennsylvania have more sense than to try to compete with the western ranchmen. They can't do it very well. You have your grain here on your land, and you run the danger of stomach worms. You may get in in time if you have alfalfa, but the corn growers can't do it. So the thing for the Eastern farmer to do is to raise his lambs earlier, and get into the market before the western lambs are ready to be marketed. Then he will have no competition from the West, and can get a good market and good prices.

Now, I think it will pay the Pennsylvania farmer to have one hundred ewes. That is a nice little lot to take care of. He need not learn to know them all by name, but he can know them all by sight.

I am not talking to you about the winter lamb business now; I am going to talk to you how the ordinary farmer can manage to make money on sheep in Pennsylvania.

He should begin in February or March, and first I want to talk to you a little about taking care of the ewes in pregnancy. That is the thing most people know little about. I love to talk about it, because I have had so much experience with it. I had the benefit of that when I was a young man and had a young wife, and a nice lot of sheep, and I was as happy as I could be. I kept my sheep very carefully housed, and protected from the weather, and led them out to water, and took all the care of them that I knew how. I had read a great deal about the value of protein in the feed and bone meal, and of wheat bran and clover hay, and oats sometimes, and I never saw anything prettier than that bunch of sheep. But when the lambs came then the clouds came over my sun. Feeding so much pro-

tein had developed too much bone, and the lambs could hardly be born at all. I remember one weighing seventeen pounds, but the mother died and the lamb died. I took it into the house and nursed it and fed it, but it died. That lamb died because I did not know how to feed. Well, an old man who had raised sheep for many years said to me "You take too good care of your sheep; let them hustle, and give them oat straw. You have wasted your feed by giving them too much." So I gave them oat straw and a little corn fodder, and they looked fine and well rounded out, but there was something not quite right. You can learn to tell that in your sheep just as a man learns to know when his wife is mad. At first he needs a diagram to show him, but after a while he learns it instinctively. Well, the lambs came, and they looked all right; there was nothing wrong to be seen, but they did not live. That ewe did not have that lamb at the physiological moment; there are forces at work in her beyond the care of man, and I learned then this wonderful thing, that if the ewe did not have milk in her udder, she did not love her lamb either. I have had an old ewe look at me, and then at the lamb, and say as plainly as if she could talk, "Joe, here is that lamb; I have no use for it; you had better take care of it." And I have tried it many times, and have nursed those lambs and fed them, and done my best to raise them, but rarely with success. And I learned this then, that if a ewe does not have milk in her udder, she does not have any love in her heart, either, and these ewes did not have milk in their udders because they did not have these lambs at the physiological moment.

Then I thought if I was careful to get a good sire, my lambs would be all right; so I exercised great care to get good sires. Then, one day I had a lamb born, and the moment it was born it looked around very lively, and found its dinner, and enjoyed it, and I said "That lamb has strength, and it is going to live," but it died. Its father lived, and its mother lived, and all its kindred. It would take a special story to tell how too much strength is not good—how it is almost as bad as too little.

Now, we have learned how the lambs should be born, and we will go back to our ewe. We keep that ewe carefully housed, and protected from the wet weather, and we feed her up with alfalfa and bran, and yet not one of those lambs will live. Why? She gets no exercise; she stands too much, and not one of those lambs will live. Keep her out doors, and give her exercise and feed her well, but not too well, and see if those lambs will not live. Our sheep must not be exposed to the weather, but they must not be kept too warm. You can't raise sheep in this way. I have a neighbor who has a barn worth \$3,000, and he has never raised a single sheep in it. He keeps it closed too tight, and his sheep get no air. You need the air.

Now, a man who has sheep should have a lot of little panels made, about 3½ feet long, and fitted with two little doors to keep the lambs together. You can fold these panels up and put them away when you don't want them.

When the first sheep are born, I tell you it is a busy time for the shepherd. The ewe may have twins—she probably will—and all the better. Take her into the barn, and put her into this little panel pen, so that

she will have room to move about with the lambs, and then you can take care of her. It is very nice to turn her over, and start milking her, so that the lambs can get their first milk, but we have not time to talk about that. You put her into this pen with her lambs, so that they will not be able to get out, and run around among the others. Never allow them to get out among the sheep that have not yet born their lambs.

Never give the ewe any change in her feed, and no increase. It may cause a great many troubles, and give her indigestion to give her anything different, but gradually decrease it while seeing that she still has enough to eat. It is a common mistake to give her some protein, and some wheat bran, and some alfalfa, thinking that will make milk.

Now, if you think the lambs cannot suck all the milk out so as to get a fresh supply next time, it is wise to milk her for a few days until the lambs get bigger.

Now, another thing; I am pretty near getting to the winter lamb business, but I want to start you right for the spring, and then we will start on that in the same way. Make a place where the lambs can go in and the ewes can't follow, and make it so that they can get in easier than out. The lamb is the creature of opportunity. Most men are like them, and some of you men here will probably go to the legislature some day, and some will probably go to the prison; it all depends upon opportunity. So, if the lamb has the opportunity to go into this place he will do so. Place in that pen a little trough, and in that trough some grain—wheat bran will do, or a little corn meal, very coarse ground, or about ten per cent. oil meal or buckwheat bran. It doesn't take long for these little fellows to get started eating the grain, and I tell you they enjoy it. Then comes the grass in the fields, and here is something I want to impress upon you; keep them off the grass when it is first growing. When you turn them out of the pen, turn them into a little yard, and keep it bright and clean, and when you give them grass, feed it to them on the ground. Why? There is nothing in the grass beyond a little coloring matter, but until he gets something to do, he does not need very much of it. When I was ranching in the West, our only anxious time was in the spring when the time came for the lambs to be turned out. We had 100,000 acres of land, most of it in clover. Now, as soon as a sheep got into it, you could tell where he stood.

Now, when you turn them out you may have some trouble about intestinal parasites. That time comes along about the middle of June. Then the ewes go out to grass with the lambs, and I tell you it is a pretty sight to see those lambs run up and down the fields, and play, and then run up to the ewe, and off again, as if asking her to watch them at play.

Make a place in the field and spread a little corn meal there for them, and one of the best things you can give them is coarse salt that you buy, and then, of course, there is the mother's milk—the best of all for them.

The winter lamb business is conducted in the same way. Begin early, and when the lambs weigh eighty pounds they may be sold. I would not keep them any longer, because then the western market comes in,

and the prices go down. I would try to have them ready for market in June and July. How are you going to do that? It is easy if you have the alfalfa to raise them on. Then with the returns from the lambs, and the old sheep left to fertilize the land, our returns will come in.

President Norton: Are there any questions? We can take a little time for discussion.

Mr. Young: How old do you let them get before you finish the ewes up?

Mr. Wing: My experience has been that so long as the ewe has her teeth she is faithful. In England it is not the practice to do that. They want them all to be four, five, or six years old. I have one ewe that is fifteen years old, and she is all right, and fat, but I don't think she would vote for "Teddy."

A Member: That man with the barn, did he have the same experience in keeping cattle?

Mr. Wing: Yes, I think so. I designed a barn for a man in Columbus. It was the finest barn I have ever seen. It was 160 feet long, and had 16 windows that opened on the inside. I went in there the other day, and he had every window closed absolutely tight, and was trying to raise some Shorthorn cattle. He said "Come over here and look at these cattle." I said "I haven't time," and went around and opened the windows. I have no doubt, though, that as soon as I was gone, his men closed them again.

A Member: What temperature would you have?

Mr. Wing: That would depend on the weather.

A Member: What area?

Mr. Wing: No larger area than necessary to get the air in.

A Member: Would you have windows on one side or both?

Mr. Wing: Adjoining sides, where the wind does not blow, will be all right. Of course, for the man who is trying to reach the early New York or Philadelphia markets a very warm place will do no harm.

A Member: Which is the best profit, winter or spring lambs?

Mr. Wing: It depends very much upon the lamb, and the man who has the care of it, but I think there is more money to be made on winter lambs.

President Norton: I will now appoint the following committees: Committee on Resolutions: J. H. Reichert of Scranton, M. P. Shoemaker of Greensburg, H. W. Comfort of Falsington, Rev. J. D. Detrich of West Chester, Henry Palmer of Avondale and Austin Leonard of Troy. Committee on Auditing: A. M. Cornell and S. F. Barber.

The afternoon session will be a joint session of the Dairy Union and the Live Stock Breeders' Association.

The meeting now stands adjourned until 1.30 this afternoon.

THURSDAY, JANUARY 24, 1.30 P. M.

The meeting came to order with Mr. Norton in the chair.

President Norton: The first thing on the program will be an address by Prof. Van Norman, President of the Dairy Union.

Prof. Van Norman spoke as follows:

Prof. Van Norman: We will now be addressed by Dr. Dexter of Washington. He represents Prof. Webster, who is unable to

be here. The talk on alfalfa will come later.

Dr. Dexter then addressed the meeting as follows:

President Norton: Are there any questions?

Mr. Mitchell: I would like to ask the speaker a question—how to increase the production and fertility of the soil by dairying. That is a most important question to most of our members.

Dr. Dexter: I have an idea that your own president could discuss that better than I can. It is by no means an easy question to answer.

In shipping away grain crops from the farm, you are shipping away a large part of the fertility of the soil. This is especially true of such crops as wheat; but in shipping away butter and milk you are shipping away only the minutest portions of that fertility. A ton of butter which is worth \$500 takes away from your farm less than \$100 worth of this fertility. You raise forage crops which are consumed by your dairy cattle, and when you sell their product you have a comparatively small article, which can be shipped at a small cost of transportation, and for which you obtain a high price, and which takes away only a minute portion of the fertility of the soil, and a large part of what you feed the cattle is returned to the soil in the shape of manure, and is worth about \$10 per cow to the farm each year, and with careful handling produces about \$30 in return.

Prof. Van Norman: A hundred dollars' worth of dairy product takes away about \$1 worth of fertility, while \$100 worth of grain product takes away from the farm \$10 or \$12.

President Norton: Anything further? If not, I wish to announce that the Resolution Committee, and members of the Board of Directors, the committee to draw up a resolution on Dr. Pearson, and the Nominating Committee will meet this evening, and report tomorrow morning at the Breeders' Association meeting.

The Auditing Committee will audit the report of the Treasurer, and report to us tomorrow morning.

The next number on the program is an address by ex-Governor Hoard of Wisconsin. He is unable to be with us, and has so written us. The Secretary will please read his letter.

Prof. Van Norman: I have his letter here; it is as follows:

Prof. H. E. Van Norman,
Dairy Convention,
Harrisburg, Pa.

My Dear Van Norman:

I was obliged to wire you today that a severe bronchial attack prevented my attending your Convention. I can hardly express to you my disappointment for I have always taken great pride in carrying out my engagements of this character, but I dare not venture upon such a task in my present condition.

Will you kindly convey to the members of the Convention my sincere regards and best wishes for the success of the cause of dairying in the grand old state of Pennsylvania? I shall be ever ready to the full extent of my powers to further such objects by any means within my reach. I think the day is breaking for the old Keystone State.

My son has wired you that he will send copies of Hoard's Dairyman for distribution at your Convention.

Again regretting my inability to fill this engagement, I remain,
Yours sincerely,

(Signed) W. D. HOARD.

Prof. Van Norman: Personally I have a very high regard for Governor Hoard, outside of his work as a dairyman, and I wish our Secretary might be permitted to send him our greetings.

On motion, duly seconded, this was agreed to.

THE RELATION OF VETERINARY EDUCATION TO ANIMAL HUSBANDRY

By Leonard Pearson

The fertility of the soil, and an advancing profitable agriculture, cannot be maintained without animals. Animal husbandry is essential to agricultural progress.

The animal husbandry of Pennsylvania is one of the leading industries of the state, and is the chief reliance of a large proportion of the farmers that work the quarter of a million farms within our borders. The farmer depends upon animals to till his fields, to take his products to market and his family to church, to supply his most nutritious food and a large proportion of his income.

What value would there be in a \$55,000,000 hay crop, (these figures relate to the crop of Pennsylvania for 1905) as under present conditions, if it were not for animals to eat it? What would be done with straw from 1,600,000 acres of wheat, and with a \$15,000,000 oat crop were it not for animals? About 1,500,000 acres is devoted each year to the production of corn, worth about \$30,000,000, most of which is fed to animals on the farms where it is grown.

The rough, bulky, unmarketable products of the farm are concentrated by animals and converted into such commodities as pork, beef, mutton, wool, poultry, eggs, milk and horses for which there is a ready market. Just as the weaver uses the loom to transform his raw material into carpets, cloth and lace, so the farmer uses animals to manufacture grass and other crude products of his fields into refined and higher priced articles.

The profits of farming depend to a very large extent upon the efficiency of the farmer's machines, both mechanical and animals. If the animals do good work, that is, if they return a good yield in the form of growth, eggs, milk, wool or labor for the food they consume, they are profitable; if they do not return a fair yield of these products, they are unprofitable. The efficiency, and that means the profit of the animal machine, depends upon its adaptation to its condition of life, and upon its adaptation to its conditions of life and upon its health. The adaptation of domestic animals to special uses results from the work of the animal breeder. Breeders have achieved some marvelous triumphs in the way of increasing efficiency and in producing and fixing form, type and breeds.

We are profoundly impressed when viewing a well executed statue by the imagination and skill of the artist. The sculptor forms in his mind a picture of the image that he wishes to express; then the image is modeled in clay and afterwards chiselled from stone or cast in bronze. The result is a likeness of a living form; it may be a

Mr. Bayard: I would like to announce that the prize corn will be auctioned off tonight, so come prepared to bid for it.

Prof. Van Norman: We will now be addressed by Dr. Pearson on "The Relation of Veterinary Education to Animal Husbandry," after which we will have the alfalfa talk by Mr. Wing, who needs no introduction to men like you.

Dr. Pearson's paper is as follows:

charger, with ears and eyes alert, with dilated nostrils, tense muscles, the whole poised denoting readiness to respond to the touch of the motionless rider. Such a life-like picture in bronze is a great work of art, a triumph of human skill and ingenuity. But how much greater is the achievement of a breeder of an improved animal type! The sculptor must be faithful to nature and copy a figure that already exists. The breeder forms in his mind the picture of an ideal animal, as yet unrealized; his plastic material is living tissue; his materials, if combined with genius, and surpassing patience, produce an animal of a new form and having new attributes. He has created something, not merely a picture, that is good to look upon, but a living, breathing, moving animal, that is better for a certain purpose than any animal that was ever produced before, and that, most important of all, has the power to reproduce its kind. Improvements in animal types, and much of the improvement in the efficiency of animals have been wrought by these rare, skillful breeders.

The breeder does not work rapidly; the element of time is needful in all of his operations. His material can be changed and modeled but slowly. It was largely on this account that the work of breeders was relatively so fruitless until a little more than one hundred years ago. The breeder was denied the use of the indispensable element of time. After making a certain amount of progress, his material was damaged, or it was snatched from him by infectious disease. Nearly all of the great improvements in the breeds of animals have developed since the establishment of veterinary schools, and since animal plagues have been brought under some kind of control.

There was less difficulty on account of its isolated location in protecting the cattle of Great Britain from animal plagues than was experienced in Continental Europe. This is one of the important reasons why distinct, improved breeds of animals were established in Britain before they were established in other parts of the civilized world. Of course, the freedom of England from invasion by armed foes was an advantage to the breeder that also came from this isolated location, but in all times animal plagues have destroyed more animals and have damaged breeders more than wars and famines, because they have spread faster, and wider, and oftener, and because no opposition could be made to their progress and ravages. The losses that come from the prevalence of such diseases are well illustrated by the effects of contagious

pleuro-pneumonia, foot-and-mouth disease, and cattle plague, when through neglect of veterinary advice they did reach England and prevailed during the second third of the last century. It is estimated by Fleming and others that the actual value of the cattle destroyed by these diseases exceeds \$600,000,000. (Fleming's estimate made in 1871 of \$450,000,000 was for only a part of the period of the prevalence of lung plague and foot-and-mouth disease). And Fleming adds: "But these examples and estimates after all give but a slender idea of the devastation, misery, embarrassment and loss that have been due to our ignorance, apathy and neglect of the teachings of the veterinary and sanitary science, which must nevertheless claim the merit of having conclusively demonstrated that the most formidable diseases can be readily repressed or altogether abolished."

It has been possible to develop the Jersey and Guernsey breeds because the cattle of these islands have been protected from infections from abroad through regulations prohibiting the importation of live animals. Of course, this prohibition has at the same time been of service in helping to keep the breeds pure, but the chief advantage of these regulations has come from preventing the entrance of cattle plagues. The older breeds of the continent as the Simmenthal, Dutch, Brown Swiss and Normandy cattle, Merino sheep, Ardenne and Percheron horses have developed in more or less sequestered localities where they have been to a large extent exempt from prevalent plagues.

Improvement in breeding comes, then, from continuous effort; and continuity of effort is an absolutely essential factor in breeding advancement. In this country we have lacked more than anything else continuity of effort. How frequently has it happened that a man has gathered together at enormous cost the best purchasable representatives of a breed. The stud, herd, or flock thus established if continued in competent hands for a number of years could not fail to be of enormous advantage to that particular breed. Unfortunately, however, such enterprises are often—I think I might say usually—short-lived.

In looking for the causes that are responsible for the melting away of these promising beginnings, I have found that disease is the chiefest. Let me illustrate. About twenty years ago, a considerable number of large poultry farms were established in the eastern part of Pennsylvania, in New Jersey, and other parts of the Eastern states. Many of these establishments were carried on successfully for a few years, and the outlook for continued success appeared to be very promising. None of these establishments is now in existence. I do not know of a large commercial poultry plant that is as much as ten years old. In nearly every instance, the reason given for the discontinuance of the business is that it became unprofitable on account of the prevalence of parasites and disease; the fowls died. When one considers the magnitude of the poultry industry, that the poultry yards of the United States produce more than the wheat fields, the extent of the loss from disease of poultry will be appreciated.

Innumerable ventures in swine breeding and in swine feeding have been ruined by disease. The keeping of hogs has been discontinued temporarily in many districts by reason of disease, very much to the detriment of the farmers in those regions, for there is nothing that can take the place in

farm economy that is held by the hog. It is quite out of the question to attempt to fatten hogs purchased at a considerable distance and shipped on the railway. To ship hogs in stock cars and through stockyards is almost certainly to expose them to cholera, and can not be done, in a business way, except in case of hogs that are at once to be slaughtered. This fact is a severe check on the swine industry, although it is not always recognized as such. It was an Iowa farmer who said: "It is a good thing that cholera takes away ten million to forty million dollars' worth of hogs every year; if it did not, the price of hogs would be much lower than it is." It would be as reasonable to desire to keep up rents in a city by burning down a few hundred houses every year.

The parasitic diseases of sheep constitute such an intolerable drain on the sheep industry in some localities that sheep keeping has been discontinued, even in the face of a rising market for mutton and wool.

I have known several promising horse breeding ventures, started with good judgment in the selection of foundation stock, and at great cost to be ruined by the prevalence of abortion, navel-ill, osteoporosis and contagious pneumonia of foals.

An enormous number of herds of pure-bred cattle have been destroyed or scattered by infectious diseases, particularly by tuberculosis, abortion, calf cholera and contagious garget. I am familiar with the history in detail of a large number of herds in the Eastern states that were carefully organized, and that were of great promise until they were extinguished, or until the enthusiasm of their owners was extinguished by reason of the excessive prevalence of some infectious disease.

It is not alone the rich owner of high bred animals who is injured and discouraged by these maladies. Nothing can be more disheartening, or in a business way, more injurious to a farmer who has a large share of his means invested in animals than to witness the insidious effects of disease, and the gradual depletion of his capital. Such men usually depend for their livelihood upon their flocks and herds. If these are impaired, they are unable to meet rental or interest charges, and innumerable farmers have in this way been carried into bankruptcy.

The average farmer is not, and is not likely to become, a breeder of pure-bred animals. Better breeding to the average stockkeeper means the elimination of the unit and the purchase and use of occasional improved individuals, especially males, from the breeders of pedigree animals. The better the quality of such animals, the more moderate the price, and the less the danger attendant upon the introduction of such animals into the herd, the more the average stockkeeper will be encouraged to use them, and the more he will grade up his stock. If pure-bred animals of good stock are difficult to acquire, on account of their scarcity and high price, and if their purchase involves material risk of introducing a new disease, the use of such animals is bound to be restricted, and the betterment of the average quality of live stock of the country will be impeded.

One must admit that pure-bred animals of good quality are neither as extensively produced nor as widely disseminated in this country as is desirable. This is due partly to the lack of appreciation of advantages from better blood, partly to prejudice, partly to fear of disease and partly to the fact

that there is such a limited number of successful breeders of pure-bred animals, and so many instances of men who have tried to breed pure-bred animals and failed, that there is a lack of sufficient number of inspiring examples. As I have shown a large proportion of these causes of failure trace back to disaster and discouragement from disease.

A hundred and fifty years ago it became evident to Bourgelat that there was need of careful study and teaching concerning the diseases of animals. The French veterinary schools were established upon his initiative, and this example was soon followed by all of the progressive countries of Europe. It was recognized that before there can be an improvement of animal husbandry, and that the first step toward the encouragement of animal husbandry must be the protection of animals from avoidable disease. Thus it is that in the old world the veterinary colleges antedate the agricultural colleges, and it is for the same reason that the word "veterinary" has priority, for example, in the name of the Royal Veterinary and Agricultural College of Denmark.

The prevalent and most destructive diseases of animals when these veterinary schools were instituted were the very rapidly spreading, quickly developing, and in many instances highly fatal maladies, such as rinderpest, foot-and-mouth disease, contagious pleuro-pneumonia, anthrax, glanders and sheep pox. Some of these diseases from the suddenness of their onset, and their high mortality may properly be designated as explosive. Within a short time any of them may spread over a district and involve a large part of the animal population. All of these diseases have been brought under control by the application of knowledge developed by veterinarians, and taught in veterinary schools. Although occasional outbreaks of some of them still occur in civilized countries, none of these diseases prevails extensively at this time, except in remote, partly civilized regions or in restricted areas in civilized countries, and then usually for only a relatively short period.

The gain from this advance is immeasurable, as is shown by the fearful destruction wrought within limited areas by pleuro-pneumonia and foot-and-mouth disease during their occurrence in this country. Pause for a moment and try to estimate the condition that would exist here if these diseases had been permitted to escape beyond veterinary control. In the first place our export trade in live cattle would immediately have been extinguished. Second, it would be absolutely impossible to keep cattle on the open ranges, as is shown by the destruction of the cattle industry of Australia by contagious pleuro-pneumonia, a fact which forced Australia into sheep production. Third, the purchaser of cattle from a distance would be exposed to dangers similar to those that now encompass the men who purchase hogs that have been shipped through public stockyards. Every one who purchased a steer for feeding or a milch cow to add to his dairy herd would take the risk, which in many cases would be realized, of infecting his herd with a destructive disease. In other words the whole character of the cattle business of the country would be changed. The loss to the nation would be as great as from a war with a great power, and to cattle owners it would be unbearable. Fortunately, these diseases were

not permitted to escape from control, and by the application of intelligent veterinary measures they have been completely extirpated. The veterinary profession does not receive from animal husbandry the credit for this achievement that is deserved.

As two other illustrations of advantage to animal husbandry from the application of discoveries in veterinary medicine I will refer to Texas fever and "milk fever."

Texas fever is a disease caused by a minute animal parasite that inhabits the red blood corpuscles of cattle. This parasite is carried from animal to animal by the Texas cattle tick. In the early history of the country this disease was each year distributed widely in the northern states by the introduction of Southern cattle. The nature and cause of this disease were discovered in 1889. Measures were at once taken to prevent the infection of Northern cattle, and with such success that Texas fever, formerly so prevalent, is now almost unknown in the Northern states. Moreover, measures have been devised for the protection of Northern cattle taken South with such success that great numbers of breeding animals have been taken to Texas and other Southern states with the result that the Texas long-horn has been practically bred out of existence and Texas bred steers are now of such good quality that many of them have taken high prizes at the great stock shows in Chicago. Measures are now being taken—measures that have been developed by veterinarians—to exterminate the cattle tick in infested portions of the country. This work has been carried out successfully in some large districts, and, although the fight will be a long one, there is no reason to doubt that it will ultimately result in the eradication of this bovine scourge. The benefits that result from the measures already taken amount to untold millions, and it is estimated by Meyer that when the source of disease is finally extinguished the country will be better off to the extent of \$100,000,000 each year. Then the South will become a great breeding ground for supplying feeders to the corn-growing states.

The other disease that I shall refer to is the so-called "milk fever," parturient paralysis or "dropping-after-calving." This disease has long been one of the principal destroyers of dairy cows of the first class. It is a disease that is most likely to take cows that are heavy milkers and while they are in the prime of life. It has had two especially untoward results: First, it has destroyed many, indeed, a large proportion of the most highly developed and most valuable dairy cows, and thus has prevented further increase in the produce of these exceptionally useful cows. Second, milk fever has seemed to establish a barrier to the evolution of the milch cow, as it has destroyed so large a proportion of the cows that reach or pass a given standard yield. In some good dairy herds the average mortality from milk fever was for many years higher than from all other diseases. By means of a simple treatment discovered by Schmidt, a Danish veterinarian, it is now possible to cure from 90 to 95 per cent. of all animals suffering from this disease. The gain to the dairy industry from this discovery is almost beyond belief. It amounts to at least a million dollars a year in each of the five leading dairy states of this country, and the saving and profit is sufficient to pay the interest on the entire bonded indebtedness of the Pennsylvania railroad. Surely

this discovery constitutes an enormous addition to our national wealth. The saving to the country is equivalent to a discovery of a new source of wealth, equal to an income producing investment of more than \$150,000,000. This discovery has already saved to cattle breeders more money than has ever been paid in building, equipping, and maintaining all the veterinary schools of the world since the establishment of the first one in France in 1762. For this valuable discovery Schmidt has received several resolutions of thanks, and his Danish colleagues have presented him a loving cup! While the full credit for this discovery must go to Schmidt, it should not be overlooked that it was based upon knowledge of milk fever that had been gradually accumulated by veterinarians through a long term of years. So, strictly speaking, the discovery belongs to the veterinary profession, as indeed, must practically all the discoveries in the veterinary sciences.

In giving these illustrations of the value of veterinary research and veterinary teaching, I have tried by concrete example to demonstrate the intimate, although not always recognized reliance of animal husbandry on veterinary protection. I have tried to show that animals would not be as well bred and as efficient as they are were it not for the measure of veterinary protection that has been afforded; and I have endeavored, also to make it clear that animal husbandry would advance faster through improving the quality of animals by the encouragement of better breeding if a fuller measure of veterinary protection were provided. I have made a careful study of this question and I am sure that I am not overstating the case in the least degree when I say that the greatest need of animal husbandry in the United States at this time is Better Facilities for Veterinary Research and Education.

Other countries have recognized these needs and have taken effective measures to meet them. The old veterinary school at Hanover has recently been re-equipped at a cost exceeding 3,000,000 marks. The public has demanded this, and the government has willingly complied with this demand for no other reason than that the value of the work of the school is such as to merit the expenditure. For a similar reason Belgium has re-equipped the old veterinary school at Brussels at a cost of 6,000,000 francs. Hungary has provided a magnificent set of buildings for the veterinary college at Budapest, where all branches of veterinary work are provided for. The government veterinary schools of Germany, France, Austria, Hungary, Russia, Spain, Denmark, Belgium, Holland and Sweden are supported on a liberal scale, first, because these countries recognize their need of veterinary development, and, second, because the value of these schools is such as to fully justify the expenditures that are made upon them, and the provision of increased resources as needed for their growing work. Either of the two veterinary schools of Switzerland is better equipped and proportionately more adequately supported than the best veterinary school in the United States.

Then honor of making the first proposal for promoting veterinary science and instruction in America belongs to the Philadelphia Society for Promoting Agriculture. A prize of a gold medal was offered in 1806 for the best essay and plan for promoting such knowledge, both scientifically and practically. The announcement states that aid to

schools and establishments for this, among other agriculture purposes, ought to be given by the national and state legislators, and adds:

"Investigations into anatomy, diseases and remedies for the preservation and improvement of animals on which our substance and comforts so materially depend must assuredly be considered worthy the most patient inquiry, intelligent observation and professional talents of the most celebrated among those who have devoted themselves to medical pursuits. As patriots it should stimulate their public spirit; as professional men nothing can more entitle them to the rewards due to their labors. Who is there among the most respectable of our own citizens, or in the highest grades of society in the Old World, who has not deemed it meritorious to promote the interest of agriculture? And is there any branch of that occupation so important as that now recommended to the notice and inquiry of medical men? If it has held an inferior rank in the classification of science and knowledge it is entirely owing to the unmerited neglect with which it has been unaccountably treated. It should be rescued from obscurity and placed among the most commendable and necessary branches of medical education."

During the following year, 1807, just a century ago, an address was delivered at the University of Pennsylvania by Dr. Benjamin Rush upon the duties and advantages of studying the diseases of domestic animals and the proper remedies to relieve them. Dr. Rush formulated under nine headings and for the first time in America, a series of powerful arguments in favor of developing studies of the diseases of animals.

It was not, however, until 1884 that the Veterinary Department of the University of Pennsylvania was established. For twenty-three years this school has taken a leading place among the veterinary institutions of the United States. It has educated 374 veterinarians who have taken the full course and have received its degree. It has now enrolled 111 students. In this body there is a considerable number of earnest young men from the farms of Pennsylvania, who are working hard to obtain their training in this fundamental knowledge underlying animal husbandry, and who plan to return to rural districts and apply the knowledge thus gained for the relief and advantages of agriculture.

The maintenance of the Veterinary School has thus far been provided by the generosity of a few philanthropic persons who have recognized the importance of its work, and by the loyalty and devotion of its teachers. The extent of the services that have been given gratuitously by members of the teaching staff of this school for a period of nearly a quarter of a century is most unusual. If they have succeeded with the assistance of their public spirited and generous friends in placing veterinary education in Pennsylvania on a sound and enduring basis, I am sure that they will be satisfied. And it begins to look as though they are succeeding, for the legislature at its last session appropriated \$100,000 towards furnishing part of the equipment that the school urgently requires. But this provides for only a portion of its work, and some of its most important branches must still be taught in wholly inadequate, unsanitary premises. It is still unable to do for the state work that the state urgently needs.

There is coming to be more general appre-

clation on the part of breeders of veterinary work, of what it has done for them, and of the importance of the objects veterinarians are striving to attain.

There are several reasons for the slow development of this appreciation in this country. Perhaps the veterinarian has not been sufficiently insistent on the achievements of his profession and the value of his services; undoubtedly the schools have not been adequately equipped, and have not been able fully to meet the very moderate requirements that have been placed on them, so that the graduates of these schools have been handicapped in their efforts to aid animal husbandry. Furthermore, public support that might fairly be expected for this important branch of education has in some states—not in Pennsylvania—been diverted from veterinary schools, where it properly belongs, and where it should go, to weak and ineffective veterinary appendages to agricultural colleges or experiment stations.

It is the aim and purpose of the Veterinary Department of the University of Pennsylvania to make available and to distribute the information that is needed to afford animal husbandry the veterinary protection it requires for its development and expansion. It can do this by training and sending out educated, capable veterinarians prepared to cope with the ever-increasing problems in animal physiology and pathology that perplex and discourage the breeder. But the school needs help, and, while I do not doubt

that it may confidently rely on your sympathy, I hope that it may also receive your active assistance.

Prof. Van Norman: Have you any questions on this paper?

Mr. Reichert: Mr. Chairman, may I have the privilege of making a motion? I have just learned that we are about to lose the valuable services of Dr. Pearson in this state, and to me, as a stock breeder, this seems like a calamity. I would suggest that the the Chair appoint a Committee to wait on Dr. Pearson, and find out whether there is not some way in which we can hold his services for the interest of the Live Stock Breeders of the State of Pennsylvania. If this can't be done, I suggest that we see the Governor, and ask him to give him a suitable increase that will keep him, and I move you, Mr. Chairman, that we appoint a committee of five to represent the Breeders' Association to take up this matter.

Prof. Van Norman: I will appoint that committee a little later. The Committee on Resolutions of both Associations is requested to meet in the little room to the right at the present time. And those of you who are interested, I want to call your attention before leaving the room to the butter exhibit on the table out there. While it is not all that we hope to have it some day, it is at least worth looking at. Note the difference in the packages and quality of contents. We will now take up the question of Alfalfa, by Mr. Wing.

HOW TO GROW ALFALFA

An Address by Joseph E. Wing

I need a little courage to stand here and talk to you about alfalfa, coming from another state, with a different soil, and sometimes when I have gone away from home to show how to do it, I have failed. Now, here is Prof. Van Norman; I went up to the University of Wisconsin for two weeks urging him to get married, and here I find him in the same condition. (Mr. Bayard: That is his misfortune; not his fault.) If I failed so badly on so small a man, how can I hope to move so large a body of men as these farmers? But when I looked at this good-looking body of men—not necessarily handsome, but intelligent looking—I said to myself, "There is no doubt but what they can grow it."

Henry Miller, a butcher's boy, went to California and landed at San Francisco with fifty cents in his pocket (he has that fifty cents yet). He did not, as most men did who went to California at that time, go into mining, but he went into a butcher shop and saved his money until he had enough to buy a basket and stock it with meat. This he arranged neatly and cleanly, and then peddled his meat from door to door, and saved his money. When he had established a nice trade he opened a little shop, where he kept his meats just as temptingly arranged. Here, too, he saved his money, and then opened another shop, and then another, and another, until he had a dozen shops scattered over the city, and became its leading butcher. Still he saved his money, and then he bought a farm out in the San Joaquin Valley, a few miles out from San Francisco, and there he sowed the first alfalfa that was ever grown in California in a large way, and that was

not very large, either. I think it was about forty acres, and it cost him about forty dollars an acre, too. It cost him a lot because he did not understand about inoculation. He had seen the alfalfa in South America, while sailing to San Francisco. Then he got more seed, and tried again, and failed and then he sent to South America for seed, and tried it again and by that time the soil was inoculated, and he succeeded. Then he got more land, then more cattle, then more land, until he has become a rich man; but I can't stop to tell you of the 100,000 head of cattle that Henry Miller has, all because he planted alfalfa.

I went west in 1876, not intending to farm it, but extending perhaps to the president, or maybe governor at least, or something of that kind, but the first thing I knew I found myself working on a cattle ranch in Utah. We had no alfalfa there then, and not for a few years afterwards, unless it happened to grow there. I think I brought it to that ranch first. But before I went there, I was in Salt Lake City, and walking up the street one day I saw a load of green hay, and I stopped and looked at it, and wondered what it was, it was so nice and green. I went over and looked at it, and it smelled just as nice as it looked. So I tasted it, and I said to myself, "It is good." Taste it, gentlemen, and see for yourselves, and if it is not good, I will give you some more. My rule is to taste the feed I give my animals, and if it does not taste good for me, it will not taste good for them. I said, "That hay is all right, and if I don't get work for a while, I can always go out and buy a load of this hay and live on that till I get something to do."

Well, after a while we got some alfalfa, and tried it on the ranch, and the cattle chewed it like a hired man chewing tobacco, and they maintained their flesh on it all winter, and thrived on it in summer, and before long we were feeding all our animals on it. And all the time I was dreaming of my father's little old farm of 196 acres down in Ohio. It was not very much of a farm, and it was not very profitable, but I loved it; it was my home; and nights and some days I would lie dreaming of it, and the old folks—a place so different from that big ranch. And after a while I began to wonder whether alfalfa would not grow there, and I sent my father about a pound of seed, and he sowed it. After a while I went back home on a little visit, and as soon as I had seen my father and mother, and my sweetheart, I wanted to see that alfalfa. I asked father where it was, and he told me it was out behind the barn, but he told me it was no good; it might do in the west, but it would not do here. So I went out and looked at it, and it was only about six inches high. Father said, "You see I am right; it may do in the west, but it will not grow here." But I began to hang round; that is a way I have—to hang round until I either succeed or know why I don't. I am not sure that it is a bad trait, either. Well, pretty soon I saw the chickens come round there and pick at it, and I said to myself, "Ah, now I see why it don't grow any higher." Then I began to think that what it needed was irrigation, so I carried some water from the well, and watered that little patch, and then I took an old barrel which had one end in, and knocked the other end in, too, and set it over that alfalfa to see what it would do if given a chance, and went off to see my sweetheart, and forgot all about it for a while. When I thought of it again, and went to look at it, it had grown up through the top of that barrel. I called father and showed it to him; he scratched his head, and said, "Do you suppose I want to grow a crop that I have to put a barrel over?" But I said to myself, "If that one plant will grow, why won't a million grow?"

Well, it was not many years before I was called upon to go home and take charge of the place. I didn't like to go, for I had been given some authority out on the ranch, and it makes a young fellow feel pretty important to be made foreman. I had to get up first in the morning, and get the bricks with which to get the other fellows out of bed, as you do when you are foreman; the only difference is that you have to work a little harder, and get a little more. But my father was old, and could not do the work any more, and so I had to go home. "Well," I said, "I will go home, and see whether I can't make a success of the old farm." I could see alfalfa, but nothing else, and when I came home from the west I brought with me seven sacks of alfalfa seed. But father said we could not afford to experiment, and we must sell that seed. Finally we compromised on a quarter of an acre, and I had seven sacks of seed! And I had an awful time selling that seed. I could not give it away; the neighbors would not have it. I could not sell it; the seedsmen would not buy it. I advertised it, but it did not want to move. Finally I did manage to get rid of it by selling it in small quantities; now, some of these same

seedsmen sell \$30,000 worth of the seed in a season.

Well, that old potato patch was rich; the cattle had pastured there; the soil had been enriched by a cover crop, and I sowed my alfalfa and it grew. The next spring I sowed three acres; I picked out what I thought was the best land I had for the purpose; it sloped down towards the creek; a part of it was gravelly soil, and a part of it hard clay. Well, down by the creek the alfalfa did not do so well, and on the clay land where it was flat and hard, it did not do so well; on the gravelly soil it grew. And I scratched my head and said, "This old farm will grow alfalfa; I must manure the hard land and drain that wet land, and then it will grow alfalfa." Father had died in the meantime, and my brothers and I were running the farm, and we began to lay tile underdrains, until finally on that farm we had laid more than 14 miles of tile underdrains, and all the time we were feeding the stock in order to make manure to enrich the soil. During those years I was not trying to make money. I did not give it any thought. My brother Willis gave it some little more thought than I did, and perhaps it is just as well, as we might not have fared so well if he had not. I only thought to grow alfalfa, and I said, "I will have forty acres of it, some day." I have a hundred now.

I found we needed more manure, and I said, "I will buy lambs, and feed 200 of them, and sell the lambs in the spring, and make some money on them, and keep the ewes to enrich the soil." My brother said, "You must be crazy; do you want to run the farm into the ground?" But I got the lambs. First we had 200 lambs, then 300, then we fed 350, and we always had feed enough for them, and the farm grew fertile; it is the most beautiful thing in the world to raise lambs, and I said to myself, "Some day I will have on this old farm 1,000 lambs." I did not tell my mother, or my wife, or any one else, but I dreamed of my thousand lambs. Well, we got seven hundred—a thousand—fifteen hundred, and now we have sixteen hundred sheep on that farm, and are shipping alfalfa to the Philadelphia market. How do we do it?

Well, our soil was limestone, and I hauled manure on it until I got it pretty rich, and then I sowed alfalfa. I had not much faith that it would grow, but it did grow. That was in 18—well, never mind the date. Well, I gathered alfalfa three times a year, and sometimes four times, for five years, and by that time it had died out some, and we planted corn. Now, before you had the alfalfa about 30 bushels of corn was a fairly good crop; even after we had drained it, 50 bushels was a good crop, and if we got 65 bushels of shelled corn to the acre, it was a remarkable yield. After we had the alfalfa we made 80 bushels of shelled corn—twice the quantity—and I can assure you of fields where we made 100 bushels of shelled corn to the acre. The more alfalfa we grew, the better crop of corn we grew, and the more corn we got, the better crop of alfalfa. That was because the soil had become inoculated, and the bacteria are living there now. Last year we grew on our farm 300 tons of alfalfa, and we expect to grow 400 tons this year. That old farm has now 320 acres, and on that farm we harvested last year more than 7,000 bushels of corn of 75

pounds to the bushel, and 300 ton of alfalfa hay, and we save some of the land for pasture for our sheep, and for the cattle, and some good Percheron horses we have.

These alfalfa roots get down into the bottom of the soil, where it has been planted for a year or two years. The plant is a heavy feeder on nitrogen in the air, and at the same time you grow alfalfa, you enrich the soil. Now, what Prof. Hopkins said this afternoon is true. Alfalfa needs phosphorus, and last year we put on our farm from 200 pounds to 400 pounds to the acre, and actually doubled our crop, and we got \$14 worth of crop for every dollar's worth of phosphorus we put on the soil.

This is what alfalfa has done for one farm. Don't you think I believe in it? When I started in in 1889, one old darkey and my father were sufficient to do all the work. Now on that farm my brothers work all the year round, and I work when I am home—and my brothers are good workers—and we have three married men working every day in the year, and we have a number of single men there, too, and I am glad to give them employment, because the more good people you get into your neighborhood the better your neighborhood. I walk out through the corn fields, and I see where a man has thrown back a clod of ground away from the corn, or where he has straightened the stalks, and I know what that man is. These things show faithfulness in a man, and these are the sort of men to have around you—people who take an interest in their work, and their surroundings. These men live there, and their little boys go to the village school with my boys, and their dinner pails are packed with the same food my boys have—they are filled with alfalfa.

Why, it is just as easy to grow alfalfa as it is to keep your sweetheart or your wife in love with you. If you know, I don't need to explain it to you. If you don't, I will say that I have never found it requires any superior talent. She does not expect you to climb the roof of the house, or to do any great thing, but she does expect of you the little things that show your affection for her, and your thoughtfulness for her.

Now, if you will get into your minds a few things that alfalfa demands, I think I can help you get your farm started in growing alfalfa successfully. What are these few things absolutely necessary?

First, the land must be absolutely dry. Dig holes in it, and inspect them, and see if they fill up in wet weather. If they do drain it with tiles. Just lay your tiles as close together as you can, and then let them go. Then take your manure spreader and give that field a thorough coat of manure, and turn it over thoroughly.

Let me tell you another thing: It is a surprising thing, I know, but it holds out. If, in plowing, you notice the blackbirds follow that furrow alfalfa will grow there. The blackbirds follow the earth-worms, and where the ground is too poor to produce earth-worms it is too poor and too hard for alfalfa.

Your land drained, you must make it rich. Now alfalfa is the greatest soil enricher that I know of, but it will not enrich poor soil. That is according to scripture, which takes from him that hath not, and gives to him that hath.

Down in Kentucky I planted more than a thousand little plots in the course of my

work there. Some time ago I passed through that state, and as I sat in the train and looked out of the window, as the train wound around the curves of the mountains, perched up on the mountain side I saw a little cabin, and a young woman in a sunbonnet in the field near it. And I said to myself, "There is loneliness and privation." There is an old bone-grilled tobacco field or two, with some sassafras brush—just enough to keep life in that young man who has started up housekeeping with that young woman in the sunbonnet, and that old mule—and then the train went round the curve, and right there on the top of the ledge lay a little field of alfalfa, and then my heart was glad, for I saw better days ahead for that young couple. That alfalfa will enrich that old mountain soil, and he will have crops to take to town, and they will have comfort.

Now, I don't know anything that will enrich a soil quicker than alfalfa will, but you must give it rich land to start on. What do I mean by rich land? I would make it as rich, almost, as I would for a corn crop. Take off the corn crop, if you want, and then start right in on alfalfa. Another thing is, it must be grown on sweet land. More of the failures to grow alfalfa in Pennsylvania have been due to lack of lime in the land than to anything else. About a year ago I was looking at some land down near Philadelphia. The land was rich, it was dry, but the alfalfa would not grow. It was lacking in lime; the soil was acid. You can put the lime there and make it sweet. The Experiment Station has not found it so but they may be wrong, for I do believe in the lime.

Now, these things are all you need. The land must be dry; the land must be rich, and the land must be sweet. The rest of it is just faith.

Then, how are you going to sow it? Let me tell you how we sow it. We sow it always in the spring, and we try to cultivate the crop of the previous year. In our corn crop we run a one-horse cultivator through it to rid it of the weeds, and it is important to get rid of the weeds early, before they spread and take a firm hold. When we have turned the soil, we work the lime in, and get the seed up by the middle of April, and we sow it always with a nurse crop of beardless spring barley. The seed is a little hard to get, but it is the best barley to sow, and it is wise to sow your alfalfa with a nurse crop of barley. It grows quickly and does not leave any stubble. Well we sow a bushel to the acre, and a peck of alfalfa—15 pounds of alfalfa to a bushel of barley. When we harvest the barley we will cut the alfalfa down as far as it will go, and then we let it grow again. Now, as long as the alfalfa will grow the first summer we let it grow. There will come a time when it will look thrifty, and then cut down on your knees right there on that alfalfa ground, and see if there are any new buds just starting out, and don't cut it until you see the new buds starting. It does not take long for a man to get down on his knees: it is a good thing for him now and then. Then, when you see the buds starting, you cut it. It will soon grow up again. We never cut it down close to the ground; we always leave about one-half of it, and we do not allow a wagon to pass over it, nor a horse.

Now, I have told you everything I know about alfalfa, except one thing, and that is, it will not grow without bacteria. Cream will not sour without bacteria. When I was out on the ranch, we used a great deal of clabber, and it made the men feel like fighting cocks most of the time. I have no doubt it was those fighting microbes that did it. But to grow alfalfa the ground must be inoculated. If your ground is inoculated, you will get a crop the first year; if it is not inoculated, you will not get your crop until the second year.

And while you are waiting for your ground to become inoculated the weeds come, so send to Washington, and get some of the bacteria. Some of these bacteria will be all right, and some of them will have been living on their wife's relatives. Then I would take some of the soil of the old alfalfa field, and some new soil, and I would sow these bacteria, and harrow the ground in the evening, after sunset, and all the rest is just faith.

Don't start in on a large scale. Try it with one acre, and when you have found which is the best land, you can try it with two acres, and then you can gradually increase your alfalfa crop. It is the best thing in the world for chickens, and for cows, for sheep and for colts. It is the best thing I have yet found to grow on the farm.

Prof. Van Norman: We will take a little time for the discussion of this subject.

A Member: I would like to ask the gentleman what his rotation is.

Mr. Wing: Four of five years of alfalfa, then one or two years of corn, and then we grow alfalfa again.

Mr. Mitchell: Do you continue dressing the land with manure?

Mr. Wing: Not unless the land is poor. We put manure in first, and then on some of the land that has not been properly treated, we use phosphate.

Now, just a word about alfalfa. Some of you may wonder how we plow. Now, it is easy. I don't know anything easier than plowing alfalfa. First, we put on a good team of horses, three horses, weighing about 1,600 pounds; then we put on them a good harness; then we get a good walking plow—a steel plow, with good, sharp, new shears. Then we get just one good Christian horseman and the thing is done.

Mr. Mitchell: How deep do you work the land when you plow the soil for alfalfa?

Mr. Wing: Why, one or two inches deeper than you ever plowed before. We would plow 12 inches deep, if we could.

A Member: Must you have limestone soil, or will it do as well to apply the limestone?

Mr. Wing: Applying the lime will do just as well. I am sorry you do not have the ground limestone here. I believe it would pay you to use it. Why, in Ohio and Indiana they are grinding this limestone, and selling it at a dollar a ton, and then applying eight or ten tons to the acre. That is nearly 100 pounds to the square rod.

A Member: When do you put the limestone on?

Mr. Wing: Well, quite a little time before you use the soil, so as to make it mellow.

A Member: On fields that you have grown alfalfa, and it does not show up very well, would you try it again, or would you try another field?

Mr. Wing: Try it on the same field. Remember, you have some inoculation there, so go right ahead there.

The story of alfalfa is a very interesting one. In 1850 a Californian brought home some alfalfa seeds, and they didn't grow. He tried again, and failed again, and his friends laughed at him. Nobody understood anything about inoculation. Finally, the chaff that fell upon these fields sprang up and grew, because the soil had become inoculated.

A Member: Will it grow for a few months, and then die?

Mr. Wing: Yes, sometimes.

A Member: Will the roots interfere with the tile draining?

Mr. Wing: Not unless it rains during the summer months, when it will fill them up.

A Member: In inoculating the soil, do you plow, or dig it up?

Mr. Wing: Dig it up.

A Member: How much soil to the acre?

Mr. Wing: About 100 pounds to the acre.

A Member: Where can I get alfalfa seed?

Mr. Wing: It is hard to get: I have none.

A Member: Is crimson clover bacteria the same as alfalfa?

Mr. Wing: No, sir; the white, or sweet, clover is nearer.

A Member: I have heard that seed from Utah and Dakota is good.

Mr. Wing: Yes, sometimes that is very good.

A Member: What is the matter with alfalfa when it grows up about so high, and then turns yellows?

Mr. Wing: That is iron rust, and if that is the matter it won't grow.

A Member: Is alsike bacteria the same?

Mr. Wing: No, sir; it is not.

A Member: You recommend spring sowing; in the eastern part of the State we have been experimenting with fall sowing, and do grandly with it. I have alfalfa that measures 16 inches with just eight weeks' growth. There was no bacteria in the soil, but there was some white clover in that field before.

Mr. Wing: Now, a word about fall seeding. In some countries where more snow will be, fall seeding is all right. In Iowa, and some other states, it is better, but in other places it does not do so well. Now, you can do this: sow barley or some other grain with it; plow until nine in the morning, then harrow over it; plow at three in the afternoon, and at six harrow it, and you will not have the trouble with the weeds that you have the other way.

A Member: What is dodder?

Mr. Wing: A little vegetable parasite that grows around it.

A Member: Do you recommend top dressing for the winter?

Mr. Wing: I would recommend a light top dressing with fall seeding.

A Member: Manure, or what?

Mr. Wing: Manure.

A Member: Up in Armstrong county our soils lack limestone. The soil is not acid, but it simply lacks lime. I put about 300 pounds of lime in one field, but where I grew alfalfa, the ground limestone was not so good.

Mr. Wing: I have noticed the same thing in the west, where they grow alfalfa.

A Member: After you have had a poor yield of alfalfa, would you re-seed that field?

Mr. Wing: I would not, unless I let it

grow for a year or two. And then, you know, you must cut it. Alfalfa will not grow unless it is cut two or three times in a season.

Mr. Young: What wages do you pay your farm hands?

Mr. Wing: I give my men \$1.25 a day the year round. It is not very much you may think, but I never pay more than that.

Mr. Bayard: How deep must the soil be? How far from the rock?

Mr. Wing: It depends upon the nature of the rock. If you take a rock that is porous, the alfalfa will grow down into it.

A Member: If you had a fairly good showing in August, would you cut it close in the fall?

Mr. Wing: No; you want to let it be to protect the roots in winter.

A Member: Do you raise your own seed?

Mr. Wing: No; don't try to raise seed in Pennsylvania. We can't raise good seed this side of the Mississippi, one year in ten, and I will tell you another thing. The bees do not care for it here as much as they do in California; they make tons upon tons of alfalfa honey there.

A Member: Then you recommend western seed?

Mr. Wing: There is no satisfactory seed east of the Rocky Mountains. You want seed from the northwest. Now, about varieties; there is one variety that is brought from Turkestan, which may be a good alfalfa in regions where it is dry and cold, but it is not so satisfactory here.

A Member: Can it be successfully sown in a corn field when the last crop is planted?

Mr. Wing: I would not recommend it. We will rather take a field that gives a ton and a quarter of alfalfa hay, and one ton of barley hay to the acre, and then let it grow.

Now, gentlemen, I think we have about covered everything, and I thank you for your attention.

Prof. Van Norman: Just a couple of announcements, and then we will be ready to adjourn. Dr. Welsh will have something to announce.

Dr. Welsh: I don't know whether I have voice enough left to do it. I only want to say that the State College last night secured Prof. Alva Agee, of the Wooster Experiment Station, for our agricultural extension work, placing him alongside of Dr. Hunt and Prof. Van Norman.

Prof. Van Norman: The meeting now stands adjourned until this evening.

Thursday, January 24th, 1907.

7:30 P. M.

The evening session opened with Mr. Norton in the chair.

President Norton: We will take up the questions of Legislation on State Fair and Sanitary Inspection of Dairies.

Prof. Van Norman: The bill regarding State Fair is as follows, we might devote a moment or two to discussing it:

AN ACT

TO ESTABLISH A STATE FAIR COMMISSION, TO PROVIDE FOR HOLDING AN ANNUAL STATE FAIR, AND MAKING AN APPROPRIATION THEREFOR.

Section 1. Be it enacted, etc., That there shall be established a State Fair Commission, to be composed of the Governor of the State, the Secretary of Agriculture, the Superintendent of Public Instruction, the

State Fish Commissioner, and other members to be appointed by the Governor, as follows: One from the members of the State Grange, one from the Pennsylvania Live Stock Breeders' Association, one from the Pennsylvania State Dairy Union, one from the Pennsylvania State Veterinary Medical Association, one from the Senate of Pennsylvania, two from the Pennsylvania House of Representatives, one from the Agricultural Experiment Station of the Pennsylvania State College, one from the Carnegie Institute of Pittsburgh, one from the Franklin Institute of Philadelphia, and two members at large—one member representing transportation interests. The members of the State Fair Commission that are appointed by the Governor shall be divided into four classes, one of which shall hold office for one year; one for three years and one for four years. As vacancies occur they shall be filled by appointees, who shall be appointed for a term of four years.

Sec. 2. The Board State Fair Commissioners shall meet annually, the first Wednesday after the first Monday in January, in Harrisburg. The Board is authorized to elect from its membership a president and an executive committee; and from outside of its membership a secretary and a treasurer.

Sec. 3. The Board of State Fair Commissioners is hereby authorized to hold once each year a state fair, in or near the city of Harrisburg. The exact time and place for holding the same shall be fixed by the Board of State Fair Commissioners at the January meeting.

Sec. 4. The Board of State Fair Commissioners shall have the sole control of the state fair, and it may make such by-laws, rules and regulations in relation to the management of its business, as a majority of said Board shall from time to time determine, not inconsistent with the constitution and laws of this state or the United States.

Sec. 5. The Board of State Fair Commissioners shall appoint some person, not a member of the Board, secretary, and fix his compensation. The secretary shall hold his office for a term fixed by the Board, not to exceed four years; unless for good reasons he shall be sooner removed by the Board. He shall be eligible to reappointment when his term expires. The secretary shall perform such duties as usually pertain to the office of secretary, or as shall be required of him by the Board.

Sec. 6. The Board of State Fair Commissioners shall appoint some person not a member of the Board as Treasurer, and fix his compensation and prescribe his duties. The Treasurer shall give bond in such sum in such security as the Board shall direct. He shall hold his office during the term for which he is appointed. The length of the term shall be fixed by the Board, but may not exceed four years. He shall keep an accurate, itemized account of all moneys received by him and paid out, and make a report and full statement with the Board annually, or oftener if required by the Board.

Sec. 7. The State Board of Fair Commissioners shall, after their annual meeting in January in each year, make and deliver to the Governor for transmission to the Legislature a report of their acts and doings, as required by law.

Sec. 8. Whatever money shall be appropriated for the purposes of a state fair,

shall be paid to the Board of State Fair Commissioners, and may be expended by them as in the opinion of said Board will best advance the interests of agriculture, live stock breeding, dairying and horticulture, manufacture and domestic arts in this State.

Sec. 9. The Board of State Fair Commissioners, in that name, may contract and be contracted with, may purchase, hold or sell property; may sue and be sued in all courts or places, and this State shall not be liable for any debts or contract of said Board. The title of the property real or personal, acquired and controlled by the Board of State Fair Commissioners shall be vested in the Commonwealth of Pennsylvania, and shall be free from taxes.

Sec. 10. The members of the Board of State Fair Commissioners shall receive no compensation for their services, either directly or indirectly, but their actual and necessary traveling and hotel expenses, while going to and from, and while in attendance upon the regular meetings of the Board, may be paid upon presentation of a specifically itemized bill and after approval by the president of the Board.

Sec. 11. Whoever shall keep any shop, booth, tent, wagon, vessel, boat or other place for the sale of spirituous liquors, or expose for sale, or sell, give away or otherwise dispose of any spirituous liquors, or engage in gaming or conduct any indecent or immoral exhibitions at or within one mile of the place where the state fair is held, shall, for each offense, be fined not less than \$25, nor more than five hundred dollars; provided this section shall not affect hotel keepers, distillers or others exercising their calling at their usual place of business.

Sec. 12. Any person violating the provisions of the preceding section may be arrested upon view or upon warrant, by any sheriff, constable or other officer authorized to make the arrest; and such officers may also seize the booth, tent, wagon, vessel or boat, and articles used for gaming to be sold, and convey the same before a justice of the peace, with the offender, and upon a judgment being rendered against the offender the said property may be sold upon the execution issued upon such judgment; and if sufficient property is not found to satisfy such fine, the offender may be committed to the county jail until the fine and costs are paid, or the prisoner discharged according to law.

Sec. 13. The sum of one hundred and fifty thousand dollars (\$150,000) is hereby appropriated to the Board of State Fair Commissioners, for purchase of a site, the preparation of the same, and for providing such permanent equipment as may be necessary for holding the state fair. The sum of fifty thousand dollars (\$50,000) is hereby appropriated to the Board of State Fair Commissioners for the payment of premiums to exhibitors and for meeting other necessary expenses in the conduct and management of the fair.

The funds here appropriated shall be paid by the State Treasurer on a warrant of the Auditor General, in the manner now provided by law.

Specifically itemized vouchers, covering every item of expense made under this appropriation, shall be filed with the Auditor General.

Sec. 14. All acts and parts of acts inconsistent with the provisions of this act, are hereby repealed.

President Norton: In answer to this question, I would state that the State Fair at Bethlehem is not a State Fair Association. It is simply incorporated under the name of the State Fair. There was an act passed in 1852 appropriating \$2,000 a year towards the State Fair, and they are drawing that appropriation still, but they have no State Fair.

Mr. Fenstermaker: It is not good policy to speak against your neighbors, and I don't want to do it, but that fair was simply incorporated to run opposition to the Great Allentown Fair. It is more of a horse-racing affair than anything else.

President Norton: If there is no more discussion, we will pass on.

Mr. Clark: Should not this bill be brought regularly before this body for endorsement?

President Norton: Well, we had better have the endorsement, and if any one makes the motion, it will be properly acted upon before we take up Dairy Legislation.

Mr. Clark: I make a motion that we bring this bill properly before the house, with the addition of a member of the State Board of Agriculture to the Commission.

Treasurer Lantz: The act creating the State Agricultural Society was passed in 1847. It should have been done away with when the act was passed creating the State Board of Agriculture. It has no relation to the State Board of Agriculture, but that does not prohibit the Board from cooperating with the State Association on the question of the State Fair.

Mr. Herr: I was present when it was drawn up, and the Commission included one member from the State Board of Agriculture. Has it been recorded? I didn't hear it.

President Norton: The bill was gotten up by the Secretary, but has not been printed. I will have it amended.

Mr. Fenstermaker: I can substantiate what Mr. Herr has said.

A Member: Is Poultry represented?

President Norton: There is no State Poultry Association.

Mr. Nelson: The State Apiarists should be represented. The organization was completed this year under Prof. Surface.

Dr. Conard: There is a new Poultry Association, which was recently organized in Philadelphia. Mr. J. D. Nevius was here today as delegate from that organization, and was made a member of the State Board of Agriculture, and given recognition at this meeting. He is the Secretary of the Poultry Association; I am not sure of his address, but think it is somewhere in the Mint Arcade, Philadelphia.

President Norton: In regard to the State Board of Agriculture, I would say that this is an oversight. In moving the files, I could not find the bill, that was presented to the House and this copy was made from an old bill that I had at home. I know the State Board of Agriculture, and I think the Poultry Association, were represented.

Mr. Mitchell: The old State Fair that held its meetings at Bethlehem, has that been abandoned? Or is it still in existence?

President Norton: I might add that the last section of this bill provides that all acts inconsistent with the provisions of this act are hereby repealed. Has that motion been seconded?

Properly seconded, and agreed by the house to endorse the bill.

President Norton: The next subject is the Dairy Inspection law. Prof. Van Norman will read the bill to us.

Prof. Van Norman read the bill.

A Member: I would like to know under

what conditions the farmer is to produce that milk.

Prof. Van Norman: Ordinary common decency. If you are giving your cows slops, or have them standing in manure up to the flanks, or give them drinking water from stagnant pools, or from streams into which the drainage of the farm yard goes, these things will have to be done away with, and the milk produced under decently clean and sanitary conditions.

Secretary Critchfield: I must confess that I was not listening as attentively as I ought to have done. What effect will this have on the retired farmer who rents his farm and lives in town, and sells his milk to his neighbor?

Prof. Van Norman: Well, if the inspector goes to his place, and finds it in a filthy condition, it will be published, and he will receive no license until he rises to the dignity of a milk wagon.

Mr. Herr: It seems to me that the provisions of this act will require an army of inspectors. We are trying to get these things as simple as possible, and I don't think there is as much danger from impure milk in the country as in the city. We have been trying to keep clear of these things in the country, but if this thing goes on, after a while we will have to sterilize our milk before they will take it from us. I don't believe that these things are so necessary in the country. If it gets in the hands of the proper people, it will be all right, but if it falls into the hands of people who are hunting trouble, there will be a whole peck of it.

Prof. Van Norman: This bill provides that the inspectors must be men who are duly qualified and approved for the position. Now, Brother Herr is in the same condition as I am as referred to by Mr. Wing today, and a man who lives alone is perhaps in danger of seeing only one side of things, but if he will come down to State College, and see the milk as it is taken from the platform, we will show him the other side of them.

Mr. Clark: Might I just ask a question for information? I do not hear very well. Do I understand that our farmers who load up this milk, and haul it out—are they subject to this license?

Prof. Van Norman: If they peddle it out they will have to pay a dollar a wagon and receive a license carrying with it the certificate of the inspector.

Mr. Clark: In reference to this sanitary inspection, I think I will like it; I think it will be a good thing. It is often a necessary one, as I will show you. Now, the farm next to mine belongs to a wealthy Pittsburg gentleman; in fact, I sold it to him. He stocked it with some fine dairy cows, and put a man there to care for them, and milk them, so that he could have clean, pure milk shipped him in the city. He told me this story himself. One day he came out to look over his farm, and went into see his man milk. And this is what he saw: The man's time and hands were about equally divided between milking, and blowing his nose—not into a handkerchief, but into the air. And he was paying this man \$2 per day to supply him with clean milk. He dis-

charged him, and got another man, but he said, "I will have to hire someone to watch him—but who will watch the man who does the watching?"

Mr. Barber: Is there any law regarding quantity? Some of us are compelled to sell milk dry measure, and then they peddle it out liquid measure.

Prof. Van Norman: There is another bill before the Legislature now on that question.

(This was later enacted into law.)

A Member: I am not selling any milk outside of my own, but I don't think you can compel a man to pay license to peddle milk. They tried it once in Harrisburg, but it did not work.

President Norton: That was simply a city ordinance; this will be a state law.

A Member: No, sir; if you will pardon me, it is in the state law; the city ordinance was not in force at that time, but the state law was already in effect.

A Member: How would it affect the people of New Jersey and Delaware, who are shipping milk into this state?

Prof. Van Norman: It would probably have no effect upon them outside of the local authorities refusing to receive milk that was not properly inspected.

On motion, duly seconded, the bill was presented for endorsement by the house, but the vote resulted in a division.

President Norton: I would say that this law is a good deal similar to the Wisconsin law. If Mr. Herr will go to any creamery in the state he will see that 50 per cent of the milk is dirty. I am a practical creamery man myself, and have the handling of from twenty to thirty thousand pounds a day. I think Mr. Herr is mistaken when he thinks all the farmers produce clean milk. This law is a good thing; it is working well in Wisconsin and Michigan, and will, I think, work well here. Since there is a division, I will call for a rising vote.

A Member: Will you kindly inform me, who is entitled to vote?

Secretary Critchfield: Every member of the Dairy Union who has paid his initiation fee, and his annual dues is entitled to vote. I should think that all those who are members of the Breeders' Association should be allowed to vote, but, strictly speaking, only members of the Dairy Union are entitled to do so. The members will please rise, and stand until counted.

A count of the rising vote, proves that the ayes are in the majority, and the bill, therefore, stands approved as read.

Prof. Van Norman: I think when you vote against a thing you should rise and give your reasons for so doing.

Mr. Herr: I would say that it is unconstitutional to tax me for selling my own produce. If you can tax me for selling milk, you can tax me for selling apples or any other farm produce. If I am a dealer you can do so, but you can't tax me for selling my own produce.

Prof. Van Norman: We will now have a paper by Mr. J. H. Reichert, of the Scranton Correspondence Schools, on "A Profitable Method of Marketing Milk."

A PROFITABLE METHOD OF MARKETING MILK

By J. H. Reichert

There are many farmers and dairymen keeping cows at little or no profit because the price they receive for their milk is entirely too low when compared with the present trust prices for grain and labor difficulties. The key to the situation then is, of course, a better market, or better prices for our milk. In most cases, before this market and price can be secured we must arrange for more modern methods on the farm for the production of clean wholesome milk from healthy cows. Some of the things necessary are: Your barn must have some method of ventilation; no matter how old the barn, the man who reads (and no farmer or dairyman should be without four or five of the best agricultural and dairy papers) can devise some plan to do this at small cost. The barn should be whitewashed every 60 days at least, the barn and cows must be kept reasonably clean, the cows should be tested annually for tuberculosis, not only as an aid to a better price of milk, but as a matter of self-protection. The udders of the cows should be wiped with a damp cloth before each milking. The milk should be removed from the barn, and cooled as soon as a cow is milked, if possible, and kept very cold—say 45 degrees—until shipping time. I know that there are many farmers anxious to follow better methods but are restrained from doing so because of the expense connected, and a feeling that they can not procure a sufficient increase in the price of milk for the trouble and expense involved. In answer to the matter of expense, I would say, that with a proper system of doing this extra work, the expense of caring for cattle and barn in a reasonable, sanitary manner, need be but a trifle larger than the cost of doing so in the ordinary slipshod way.

At Willow Glen Farm, we seem to have a fairly good system of ventilation for a 100-year-old barn. We keep the cows clean and whitewash the barns once a month in summer and every 60 days in winter, with a spraying outfit; this is done by the regular farm help in less than one-half day. At milking time we have a bucket and cloth back of each row of cows, so that the udders can be wiped before milking. I am sure this adds no cost, but makes the milking more pleasant, because the udders are clean. I have never seen the milker who did not become disgusted with a dirty udder. I know of no class of people who are slower to respond to progressive methods than my own, the Pennsylvania Dutch, yet these people follow the weighing of the milk, and the wiping of the udders religiously, because they see the value of it. It is plain to be seen that with me it adds but little, if anything, to the cost of production, but adds considerable to the value and wholesomeness of our milk and gives us a ready market at one cent a quart above the regular price. Let us see how this would figure out in a 5,000-pound cow. Five thousand pounds of milk would give us approximately 2,390 quarts.

2,390 quarts @ 4c	\$ 95.60
2,390 quarts @ 5c	119.50
or an increase of \$23.90 per cow for clean milk. In a 20-cow dairy, the difference would amount to \$478 annually.	

I appreciate the fact that so long as the farmer leaves himself entirely in the hands of the middlemen, he must take the price offered, regardless of quality. There is, how-

ever, in every community, a ready and growing demand for better milk for which at least two cents above the average price can be secured, and milk produced in the manner described is worth all, and more, than the additional two cents a quart that is asked, and people will welcome an opportunity to get such a product if the farmer can bring the superiority of his product to their attention. After having made arrangements to follow reasonable sanitary precautions at Willow Glen Farm in the production of our milk, I went to two nearby cities and saw the retailers and explained the kind of milk I had to sell, and soon discovered that the retailer was anxious enough to handle such milk if he could procure it just as cheaply as the "don't care how" produced kind, but absolutely unwilling to sacrifice any of his profit, so long as the public was satisfied, or at least stood for the imposition. I then looked around for a man willing to go into the milk business on a reasonable profit basis. Arrangements were made to place the merits of our milk before the people, a nice descriptive circular, with a mailing card for a request to have our man deliver a sample bottle was put into each circular, and these circulars covered the following points:

1st. This milk is produced from a tested herd, absolutely free from tuberculosis.

2nd. A certificate from the local veterinarian who tested the herd, also a statement from him in regard to the sanitary condition of the barn, etc.

3rd. An explanation showing the importance of clean milk from healthy cows to babies and invalids.

4th. Instructions to consumers how to take care of milk after it was delivered to them and explaining the danger of allowing milk to become contaminated.

A letter enclosing the circular was also sent to each one of the physicians in town.

Although we did not have a single customer before we started, when we were ready to deliver we had orders for 150 quarts daily, and at the end of 30 days we had sale for all we had at that time—200 quarts daily. We have received for our milk five cents per quart, delivered at the station. This milk was retailed at eight cents a quart—two cents higher than the average price for milk.

In a town where ordinary milk sells for eight cents, ten cents can easily be procured for milk of this quality. In other words, in order to market milk at a profit, the farmer must arrange for the production of milk cleaner and better than the average; and second, carry on an advertising campaign to educate people to appreciate good milk and to believe in his particular product. A proper advertising campaign like the above, can be carried out anywhere for a sum not exceeding fifty dollars.

We, as farmers and dairymen, need to learn the value of advertising in order to create independent markets for our products. If a man has something good to sell, he himself must reach the public and create a demand. In this way only can we secure decent treatment and fair consideration from middlemen. The man who builds up a reputation for his own goods can generally dictate his own terms.

An increase of a cent, or a cent and a half per quart, is quite an item, and is sufficient to make many dairies that are not

now profitable, earn at least a satisfactory dividend for the dairyman or farmer. I believe that work of this kind would stimulate the dairy business in many communities. If we are ever to get better prices for our products, we must teach the public that there is more than one kind of milk. Once people know how to discriminate, there will always be a demand for the better milk and at better prices.

Do not let the fact that you are not close to a town or city discourage you from making an earnest effort to secure for yourself better profits as a producer of dairy products. This will enable you to surround yourself and family with more of the things that go to make farm life pleasant and helpful to all connected with it. The plan outlined by me, and followed by myself, will enable you to ship milk at a profit if you live four miles from the railroad, and one and three-quarters hours by rail to the town where your milk is to be sold. I mention these distances because I have proved that within these limits, at least, this plan can be carried out in a very satisfactory manner to all concerned, producer, retailer, and consumer. Prepare to produce a good article, and then tell its merits over and over again until the public will believe in its superiority as much as you do yourself.

Now, I shall be glad to answer any questions, and I will say to all of the farmers, I think that if there is one class of people who has the good of life, it is the farmers, and I think a man who understands dairying, is fitted to stand shoulder to shoulder with any class of professional men in the country today. If you have a good article, why not talk about it, and tell its merits, until the people believe in it, too? If you do this, you will rise to a higher and better level.

RESULT OF MILK AND CREAM CONTEST

By Ivan C. Weld, Dairy Division, United States Department of Agriculture, Washington, D. C.

I am very glad to have this opportunity to meet with the dairymen of Pennsylvania, and to discuss with you a subject that is closely related to your prosperity as dairymen, and to the general welfare of the community as a whole. We are a milk consuming people, and it is a significant fact that the human race for many years has been becoming more and more dependent on cows' milk for food. That our dependence on the cow for this food will increase as time goes on, we cannot doubt. As dairymen, as producers of market milk, you are expected, for a just compensation and a fair profit, to feed the people. You must then, for your own benefit as producers, keep in close and sympathetic touch with the consuming public. You must ever be ready to anticipate the wants of the consumers, and to supply those wants, if you would secure and hold their confidence and win for yourselves a profit in your business.

It is for your best interests that the consuming public have absolute confidence in you and in your ability to produce and to deliver into their hands a food product that is pure and clean. It is a long time since it was discovered that cows' milk was good for food. It was one thing for primitive wants, but it is quite another problem under present conditions to produce and transport long distances milk that shall satisfy the

Prof. Van Norman: If any one has any questions to ask, we will take a few minutes, after which we will hear the report of the bacteriologist who has examined the milk sent here—Prof. Weld, of Washington.

Mr. Comfort: While the bacteriologist is arranging his samples, I will ask the gentleman who gets 5 cents for his milk what it averages in butter fat?

Mr. Reichert: I would say that it averages 4.7; often it goes higher. Do you think we sell blue milk here among the Pennsylvania Dutch?

Mr. Comfort: You are getting five cents for it; I simply asked for information, and this is the information.

Mr. Roberts: To corroborate what Mr. Reichert has told you about receiving five cents for his milk, I will give you a little experience in the Philadelphia market that I had in the past few years. I had been receiving from \$1.20 to \$1.60 per hundred pounds, but I thought my milk was worth more than that, so I went to see a private party in Philadelphia, guaranteeing that my milk would contain 5 per cent butter fat. I have since been receiving five cents a quart the year round, instead of shipping to middlemen at three and a half cents. It shows that you can find the trade if you hunt for it.

Mr. Powell: I began my dairy business in the manufacture of cheese, and I get 6 cents where the others get 5 cents. If you have a good article you can find a market for it, but you must be careful to keep up the standard. If you fall below once or twice you will lose the market.

Prof. Van Norman: We will now have the pleasure of listening to Prof. Weld.

Prof. Weld reported as follows on the samples of milk sent for examination:

appetite of the millions of human beings who have never milked a cow and perchance have never seen one.

It was evidently intended by the Creator of all things that milk should be furnished to the young without ever coming in contact with the atmosphere, and foreign substance or thing whatsoever. Under such conditions, all agree that milk has no perfect substitute. When, however, man makes his hands take the place of the calf's mouth and the milk, instead of going directly to the calf, passes through the air into a bucket, he has interfered with the natural process, and the condition of the product when it reaches the consumer will depend almost entirely on the conditions under which that milk was secured and cared for. The producer is largely responsible for those conditions, and he should accept his responsibility like a man.

In the great interest and haste in matters pertaining to the breeding and feeding of dairy cattle for the last dollar obtainable, the sanitary side of the dairy business—the matters that pertain to the health of the cow and the health of the consuming public—have, in many localities, been neglected. Neglect, however, could not always remain covered, for the natural result of uncleanness in any kind of work must sooner or later make itself known. Thus it is that

negligence or ignorance on the part of some one is occasionally uncovered in various parts of the country by the discovery of disease in herds of dairy cattle, or among people who have obtained their food supply from a common source.

Many dairymen now know and many others have yet to learn something of the nature and influence of even a little dust in the air of the stable, or a little loose dirt or hair on the cow's udder and flanks at time of milking. Many dairymen now know and many others have yet to realize that a milk pail, strainer or can that has not been well cleaned may become a source of trouble.

Many dairymen now know and many have yet to learn that even a very small piece of dirt, a hair or a fly falling into the milk carries with it many thousand small plants which find in the milk conditions well suited to their growth and increase. Dairymen, as a rule, are careful to strain out these visible things when by some accident they get in the milk. If these little plants or bacteria were only large enough so that the dairymen could see them, he would doubtless remove them also. Unfortunately he cannot see them or remove them. Hence it becomes the part of every honorable milk producer to observe and practice such methods as will keep bacteria out of the milk, so far as it is possible to do so.

Second only in importance to cleanliness in all its details is the matter of the prompt and efficient cooling of milk. The cooling cannot take place too quickly after the milk leaves the cow, neither can the temperature be made too low, provided, of course, that the milk is not frozen.

The dairymen who are today furnishing the best milk to our city markets are the dairymen who are most exacting regarding the conditions of cleanliness and low temperature, and I may also add they are the dairymen who are making the most money.

Unfortunately there are various standards of cleanliness among producers, as well as among consumers of market milk. Conditions which may be acceptable to one person may be offensive to another, hence the desirability of producers occasionally exhibiting their products at dairymen's meetings, and having those products carefully examined and scored according to definite and well established standards of excellence. If there can be friendly rivalry among the dairymen for the highest score and honors, so much the better, as that helps to stimulate and to encourage the consideration of conditions which make possible the production of a cleaner and higher priced product. You have done well to start such a movement in this Dairymen's Association. There is much yet that remains to be learned in connection

with the production and distribution of milk and this Association, by encouraging exhibits of milk and the discussion of influences and conditions affecting its production and distribution, can do much to promote the interests of all milk producers in this state. You will also render a public service—a service that should entitle you as an Association to public recognition and support.

Although the number of entries in the first exhibit is not large, a beginning has been made that should eventually lead to substantial results.

In discussing the method of scoring these samples, let us first consider the matter of flavor. Forty points out of 100 are given to this, because flavor or taste is a very important thing in milk; no matter what other desirable qualities it may possess, if it does not taste good no one cares to use milk for food.

Composition, that is the percentage of fats and solids not fat, are given 25 points. It is important that the quality of the milk be good and up to established standards.

Under the head of keeping qualities is considered the number of bacteria per cubic centimeter, and the degree of acidity or sourness that has developed. It is important that the number of bacteria be within such limits as will ensure the healthfulness of the food. An excessive number may also affect the keeping qualities, while the amount of acid developed indicates to what extent, if any, the milk has already soured. The number of bacteria may also be considered as an indication of the degree of cleanliness and care which is practiced by the milk producer.

The appearance of any article offered for sale has an effect on the consumer and also influences the selling price. It is, therefore, important that milk be put up in clean bottles, that the bottles be free from metal parts, that the caps fit tightly and present a neat appearance. There is also another thing considered in judging milk and that is the matter of sediment. Now, sediment is something that should never be found in milk. Unfortunately it is oftentimes present, and when found its appearance in the bottom of the bottle cannot fail to be disgusting and repulsive to the consumer.

All the above conditions are considered in detail, and the score of the milk is affected according to the conditions found.

The conditions found by me in the milk exhibited at the meeting have been plainly marked on the score card, which can be found with each exhibit. The summary of these conditions, including a few samples purchased on the streets of Harrisburg, are as follows:

Report of Milk and Cream Samples Exhibited at the Meeting and Purchased on the Streets of Harrisburg, Pennsylvania.

No.	Fat.	Total Solids.	Acidity	Flav'r	Appearance	Bacteria per C.C.	Score.	Remarks.
1	4.90	13.88	.198	33	10.	925,000	84.	
2	4.80	13.63	.188	35	10.	539,200	80.	
3	30.50	.....	.183	36	10.	44,100	96.	Cream.
4	4.20	12.79	.181	34	9.	640,000	87.	Sediment.
5	6.00	14.95	.175	32	9.5	1,370,000	79.5	Slight sediment.
6	10.50	.....	.144	34	10.	190,000	85.	"Cream."
7	5.20	14.24	.189	34	9.5	850,000	86.5	Slight sediment.
8	9.00	.....	.192	33	9.	11,200,000	58.	"Double cream." Sed.
9	3.60	12.57	.19	30	7.	3,789,000	62.	"Past'r'd." Much sed.
10	4.60	13.02	.19	34	9.5	4,400,000	68.5	Slight sediment.
11	10.75	.....	.195	30	9.	5,706,000	56.	"Cream." Sediment
12	4.20	13.04	.204	35	8.	1,075,300	82.	Sediment.
13	5.30	13.86	.174	34	10.	861,000	86.	

President Norton: I have asked Dr. Pennington, of Philadelphia, to say a few

words to us.

Dr. (Miss) Pennington spoke as follows:

ADDRESS BY DR. PENNINGTON

The consumer has a side as well as the producer. Now, we get milk in the City of Philadelphia, and we are doing something in the way of experiments. What we are doing is very small, but I feel the results warrant the continuation of the work, and I think it is doing good. The experimenters are bringing in samples direct from the platform to us in the laboratory, as well as those that come to us through middlemen.

So far as adulterations in it are concerned, we have found very little boric acid, or other adulterant. I think the figures for 1906 are five-tenths of one per cent in the City of Philadelphia.

On the other hand, we have to contend with what Dr. Weld has shown us in the bottom of the jar—manure. That is what we have to contend with, and what I shall speak of, because I think if it is brought to your attention it will make it easier to overcome some of the difficulties that are connected with the shipping of milk. There is no real need of its being there, but it is not so easy to discover.

Then we have another form of organic matter to contend with—dyspeptococci they get into so many of the cells in the milk that we have strictly a form of pus. We find a large percentage of the milk coming into the city that contains these things, and it is injurious to the health of the community. You might as well feed your babies on poison. The adult is in danger as well, but they are not so susceptible as babies, although they often succumb. I examined last year about 10,000 samples and about 20 per cent of these samples contained something which made the milk unfit for use as food.

Now, I don't think it is a very difficult matter for us to alter these conditions. If we keep the cows reasonably clean, and the milking reasonably clean, and the utensils reasonably clean, there is no reason why these conditions should exist. The milk is being sorted out by the middlemen, and when the housewife gets it it looks reasonably clean. The housewife does two things when she gets the milk; she looks for the cream, and she looks at the bottom of the jar. If that looks all right, it substantiates the purity of the milk, in her opinion. Now, the sediment does not settle in the bottom. They have it filtered, but they do not get it all out, and it is mixed with the milk. From an aesthetic point of view it is not pleasant to contemplate it, but from a san-

itary point of view, it is the bacteria that do the harm.

We hear a great deal about Pasteurized milk, but Pasteurizing will not kill all the bacteria. Keep the milk cold; keep the utensils clean; bacteria do not thrive in the cold. And then it can be shipped so as to be a palatable and a healthy food. If such conditions can be obtained by dairy inspection such as has been proposed here tonight, it is the best thing that can be done, because there is at all times a market for a good article. I am quite sure that the City of Philadelphia is willing to pay for a good article. The market is there, and the people need these things more perhaps in large cities than anywhere else, but they need them everywhere. Milk has for a long time been produced so dirty that I am afraid the general public prefers it dirty. Just let me tell you an incident that I know to be true:

A producer near the city produces a milk guaranteed to contain less than 10,000 bacteria, and which ordinarily contains less than 2,000. It also contains about 5 per cent butter fat. One of this producer's consumers complained that the milk had no taste; it tasted more like skim milk than anything. This consumer was asked to visit the dairy, and was given a glass of milk. He said that was just exactly what he complained of—the milk had no taste. The proprietor gave him another glass of milk from a second bottle. That he said was better, but not quite right. Then he gave him a third glass, from a third jar, and that, he said, tasted just right; that was exactly the thing he wanted. Then the proprietor explained just what he had done. The first glass was pure milk—as clean as it could be made; in the second glass he had mixed a small piece of manure, and shaken up the bottle well, and in the third, he had put in quite a large lump of manure, shaking the bottle thoroughly, so as to mix it well—and that suited the consumer. I think we need to educate the consumer.

Prof. Van Norman: After the next talk, by Prof. Christie, on Corn, we will have an auction of the corn out there. We all know the good work that is being done in our neighboring states in the way of growing corn, and we know the man who is doing the work. A disciple of that man will present to us some of the methods of work, and its results. This young man has worked for several years under Prof. Holden, the corn wizard of the West. I now have the pleasure of presenting to you Prof. Christie.

CORN GROWING

By Prof. G. I. Christie, Indiana Experiment Station

Mr. Chairman, Ladies and Gentlemen: So many times have I heard speakers in the last few days say they were glad to be here, and congratulate the people of Pennsylvania on being such a good-looking lot of people, that I have come to the conclusion that we are about the only people, and I am glad to be here.

When people rise to the very pinnacle of fame, as some of us think we have done, they usually make their own terms, and

when I am asked to make an address, I usually tell them that I have two rules without which I will not speak; the first is, I must have from two to three hours' time in which to tell what I want to say, and the second is, that I will not talk after nine o'clock in the evening. I must break both of these rules tonight, as I want to let you go home, and it is already considerably after nine o'clock.

It seems ridiculous for me to come here

and tell some of you people who have grown corn more years than I have lived, how to grow corn, and I want to say that I do not come here as knowing all about it or to tell you all about it. I simply wish to impress on you tonight the importance of doing some of the things you already know. Our agricultural improvement is coming to the people as nothing new—just as telling you that you need pure food and other things are not new things, but telling them to you impresses their importance upon you.

Prof. Holden has 228,000 farms in Iowa, and he has increased the yield 5,000,000 bushels. We, in Indiana, are simply trying to wake our people up. When I first went to the farmers there, some of the old gray-bearded men said to me, "That's all right for you fellows in Iowa, but we don't want it here. You can run your corn experiments, and do these things there, but our people are too conservative; our people are not as sensational as they are in the west. Joe Wing, here, who does things with alfalfa, he came here and tried to get us to do them, too, but our people went ahead in the old way and forgot all about it."

Indiana had averaged from 35 to 38 bushels per acre, which was not large. La Porte county on the north, and one of the largest we have growing corn, had this year 60,000 acres of land in corn. They had got in some parts an average yield of 38 bushels per acre, and on the hard clay soil they had an average of 32 bushels per acre, and thought they raised their full share. We went up to La Porte county and increased their yield to 50 or 60 bushels per acre, and then they said they were making money, and they saw their land increasing in value, and they were satisfied.

But we wanted to raise the yield in that county, so we decided to get the boys interested. There are several banks in that county, and we went to the bankers, and induced them to offer prizes to the boys to arouse their interest, and the boys undertook the work, and their yield astonished some of those people. Why, one boy had an average of 114 bushels per acre. Then more boys came, and they raised each one acre of corn on the sand hills, and the clay banks, and the marsh lands of La Porte county, and at the meeting on December 14th, 8,416 boys reported. One boy, in low marsh land that was sold two years before at \$5 per acre, raised 119 bushels of corn of 70 pounds to the bushel. A boy of 18 demonstrated to the people of La Porte county something that they had never attempted before. The president of the school district gave a sworn statement that the average of those boys was over 84 bushels per acre. Well, we needed more money to continue our experiments, and I went up there one morning, and a man interested in the Legislature took me around in his automobile, and within a few hours we had secured all we needed. It is just a little matter of getting what you want. That is all there is about it.

They became interested up there; and then the question came up, "Can we afford to raise beef cattle on \$100 of land?" and I have heard farmers say that they could not raise cattle on \$100 of land; they needed it all for corn. And once, when I presented this report of La Porte county, one old farmer said, "Could I take care of 40 acres of land the same way that boy took care of his one acre?" I said, No, sir; cut it in half, and take care of twenty acres, and instead of 35 bushels an acre, you will

have 75. Turn the rest into grass, and in a few years that old farm will be worth more than you ever saw before."

The question is how to get more corn on the same land, and the thing is how to do it. That is what you want answered, and that is what we want to answer. The first thing is, to get the variety of corn that is best suited to the soil and locality. Many of us, through ignorance, have allowed our land to run down to the point where it will not produce corn any more, and others have, through hard work, brought up the standard of corn, but they still lack in production. Now, these men are here, the same as they are in Indiana, and other states, and these are the men we want to help. We want to find out what will most benefit them. Now, how are we going to find this out?

Now then, a few years ago the men at the Experiment Station got together and decided that they would try to get the corn that averaged the largest yield, and then teach the farmers of the state that this was the corn for them to plant. So these Experiment Station men—I was one of them—sent to the north and to the south, and to the east and to the west of the state, and procured samples of the different varieties of corn grown there, and we planted them in nice little plots, and awaited results. The southern part produced 60 bushels per acre, the north 30, the east 40, another 50, and so on. Then we published these results and sent them over the state, and told them "now you know." Well, they tried it; and the corn grew; in fact, I think it would be growing yet if the frost had not stopped it. But it did not ripen and develop, and they had to harvest it when the time came, but it was a miserable lot of corn. You may have read that one year the corn crop of Indiana was a failure, and the corn not up to standard. That was the year. Well, they harvested that corn, and then their troubles began in earnest. The elevator men refused to take that corn; no one would have the stock. Finally they compromised on a lower price, and the corn was shipped away, and one after another of these farmers came to us and said, "We have lost \$1,800 or \$8,000," as the case might be, "on the corn we shipped out last year, and the only reason for it was that that corn was not fit to be shipped," and they blamed the Experiment Station—as they had a right to do. One old fellow said the reason was that those fellows up at Purdue had taken the corn away from home, and tried to get results on different soils, consequently the results they offered were not accurate and had no value, and he was right.

So the last two years we have had a man at work in each section, growing corn. I want to speak of this, because it is of value to the people of Pennsylvania. The best way to obtain results, and determine what is needful for that particular soil is by Experiment Station right in your own county. For instance, for the farmers of Lancaster county, a station right there in Lancaster county, doing the work there on that particular soil, and awaiting results. Well, this is the way we did it in Indiana.

We have in every county a poor farm, which has never produced anything for anybody, and nobody expected it to do so; in fact, people usually forgot all about it until they came to pay their taxes, and then they grumbled a little at it. So we went to the authorities and got permission to use these poor farms for our work, and then we went to the farmers and asked them to

co-operate with us, and in Randolph and Clinton counties, where we carried on this work, we had about a hundred of them interested. In Randolph county, on the 10th day of May, over 20 farmers gathered together, and each one had a sample of the corn he was going to plant that year. Then they each took a plot, and planted it under the instructions of our Experiment Station, and they got results that surprised them. They ran from 47 up to 90 bushels per acre, and I sat down and figured it out for them; by planting No. 1, which averaged 90.3 per acre, the farmer would, on 40 acres, have just \$1,900 more than he ever had before. That particular variety would produce the largest yield on that particular soil.

You can do the same thing in Pennsylvania. Take the man in your neighborhood who gets the largest average, and instead of sending out to Indiana or somewhere else for some of this red-letter corn that is being grown there, and which will probably not produce one-half as much on your soil, owing to the difference in soil and climate, go to the farmer in your neighborhood who is getting the best results, and get some seed from him and plant that, and see whether you will not obtain the same results in dollars and cents.

I want to say right here now that I think Pennsylvania is ready for improvement in corn, and I would like to get your young men interested. The farmers of Pennsylvania have not figured out exactly the best variety in corn farming. Now, in Ohio, and Indiana, and Iowa, we have Corn Growers' Associations, and they have figured out for the farmer that this is the best variety for him to plant. They have figured out that an ear of corn about 10 inches long, and $7\frac{1}{2}$ inches in circumference is the best sized ear. It will have less cob, and more rows of corn well filled out. Our men, three or four years ago, began to point out to the farmers the difference in the size of the ear of corn. We have found out that an ear of this size will fill up the wagon to better advantage. It will have more rows, and be better filled out all around than the longer ear. We had quite a time convincing these farmers, but we kept at it until we did convince them. I believe that in Pennsylvania you can grow any kind of corn you want. I believe you are getting away from things when you begin to mark the difference in corn. Now, take these two specimens, one about 11 inches long, and the other probably one-half larger. Now, when these were weighed up, the smaller cob was practically within three-fourths of the weight of the larger. The little one weighed 16.14 pounds of cob to the hundred, and the other one went 20, so you can see that on the larger cob we are getting less corn per cob.

Now, take this cob, 10 inches long, and $7\frac{1}{2}$ inches in circumference, with a straight row from butt to tip, with a straight row evenly filled out to the end, and uniform in size and shape. I would rather have an ear of corn filled out well, than to have it run down well to the end. Here is another ear, which started out very good, but these grains ran along, wedge-shaped to the edge. Now, when you get up to within an inch and a half of the top, you get a very poorly filled out corn, and while it has a few more grains to the end, it has lost 250 on the butt.

Now, I see the one main reason for these different sizes of cobs is that you have in your state no standard. That is, you have never had explained to you, and have no organization which has adopted a standard

for an ear of corn. In our state the north is now running about 9 inches, and the south about 10 or 11 inches, and that is giving the best results.

I am unable to discuss the subject fully in the short time I have, but I will say that I think we have come to the place where we think we have the best of the corn situation in Indiana. We have 2,500 plots on farms. We have gone into the country and set the standard at 100 bushels per acre, and as a result we have raised it; in one case the average was 55.1, where it had formerly been 25; in another 46, and so on, all over the state we have succeeded in getting a better standard. We have given them a better variety of corn, but the question is how to raise the standard. Now, we have seedsmen in our state, and I don't know but what you have them in your state; they are usually round. Last winter we needed 300 bushels of corn to apply on our farms, and we went to them and said, "We need this corn," and these seedsmen sent us down the best corn. Then we took the different varieties of corn and laid them out in rows, and marked them one, two, three, and so on. Then we made boxes about 3 feet long and 2 feet wide, and put up little bars inside about 3 inches square, of galvanized wire, and filled these boxes with sand. You can do the same thing, and these boxes can be filled with sand or ground. Then we took from No. 1 five grains, and planted them in one of these little squares, putting in a marker "No. 1"; in the next square No. 2, in the same way; and so on. Then we put a cover on the box of a piece of carpet, and kept the box at living room temperature, and at the end of five days you can tell whether the seeds are going to show up good or not. If at the end of the five days it has germinated you will probably get good results from that corn; if not, you had better throw it out. If you don't, you will have trouble.

Here is an ear of sand-hill corn, which is near the desired standard for an ear of corn. Here is another corn produced with more sunshine, and more moisture, but which gives you just about one-third as much as the other. Here is another sand-hill corn, raised in moisture, which produced these nubbins. There is something wrong in the breeding of this corn, and if we could get back to the original stalk we would find the same thing. Here is another, and if, as we are told, corn reproduces itself, this will not produce an ear of corn. Instead we have nothing but barren stalks and tassels. Now, right here in germinating, we can pick out the poor ears and cast them aside. If you do this, it will give you in return dollars and cents.

Now, as I said, there are many other things here that it would be well to talk about, but the hour is growing late, and a few questions may be in order. If any of you people have any questions, I will try to answer them this evening, but you will find, if you ask them, that I don't know all about it.

A Member: How far apart do you plant your corn, and how many grains do you put in hill?

Prof. Christie: About 3 feet apart, and about two or two and one-half stalks to the hill.

A Member: At what depth do you put in the corn?

Prof. Christie: That depends upon the season. Early in the season we plant it about $2\frac{1}{2}$ inches deep; later we plant deeper. Down in the White River bottoms, we are

now making our furrows and planting the corn right in it, something on the same plan as is followed on the Mississippi River bottoms.

A Member: The trouble with me is that we don't plant the corn deep enough in that way.

Prof. Christie: If there is a good sub-soil, the furrowing can be new down, but where there is a bad quality of sub-soil, it can't be furrowed.

A Member: What is your method of cultivating?

Prof. Christie: Just as soon as we get it planted, and about two weeks afterwards, we use the harrow. Some people talk of putting on the weeder, but as one old farmer said to me last fall, "If you have nothing else to do, the weeder is a mighty good thing, but if you have plenty to do you had better get a harrow."

A Member: Before the corn comes up?

Prof. Christie: Yes; before the corn comes up high enough to grow.

A Member: Do you keep on working it if there is grass on the ground?

Prof. Christie: We try to break it up with the weeder, after which we work it. We usually sterilize the ground for three or four days. The best time to get rid of a weed is just when it starts. If you let a weed grow for a few days, it will begin to germinate. If you break it up right off, it is best. We generally go over it several times before the corn is up, and once or twice afterwards.

Mr. Fenstermaker: Is planting in rows with single kernels just as good as furrows?

Prof. Christie: Just as good; I think the former is really the handier. The general rule in our state is that where a man starts his ground well, he can use the check rower. If he has a fluke on his land, he must harrow it down first and then use the roll.

A Member: What is your opinion of kiln-drying corn?

Prof. Christie: It is a very dangerous practice in amateur hands. I know of one case in Iowa where a man fixed up a fine room, put a stove in it, and built a little fire, and spread out his corn to dry. A couple of days afterwards he was called to Chicago, and he said to his man, "If this weather keeps on, keep a little fire." After he went away, his man thought if a little fire is good, more is better, and when the man came home, his corn was beginning to germinate, and he lost a thousand bushels of corn. Now, we have a man in Indiana who puts up a large corn crib, and spreads his corn on racks, and covers it lightly, and keeps it at a dry temperature, and he has excellent success with it. If we can get a sufficiently good and dry heat it is all right; if not, it is all wrong.

A Member: How high should the temperature be?

Prof. Christie: If I could keep it dry, I would not be afraid of any temperature. It must, however, be kept down to about 60, I suppose, but a higher temperature would not hurt it unless it got too high. We can get corn so dry as to practically destroy its germinating power, and when it is put in the soil, the soil has hard work to liberate its life giving powers.

A Member: It is quite a common practice in Chester county to put it in cribs and select it from it.

Prof. Christie: For the average man it is bad practice. In the first place, he does not know anything about his corn. You know corn will always reproduce itself, and if you plant the seed of a barren stalk, even

under favorable circumstances it is likely to be barren. It is safer and wiser to select your seed corn carefully and test it before planting in the manner I have described.

A Member: Do you use the entire ear for seed?

Prof. Christie: No; the entire ear cannot be used satisfactorily. It could be used if it could be handled, but where we use the planter, we cannot get it distributed properly. There have been some experiments made by investigators which seem to prove, too, that the top grains will not produce as many bushels as seeds from the body of the cob. There is some reason for this, but I am not prepared to give it. My main reason is that we have no planter made that will plant the entire ear.

A Member: Do you recognize any effect from self-fertilization?

Prof. Christie: Not in the average ear, we do not find that they suffer from self-fertilization. The trouble from self-fertilization is very small. The trouble is more with non-fertilization. We do not regard that as very important; the average seedman should not have any trouble with it.

A Member: Has the barren stalk been entirely eliminated?

Prof. Christie: No; don't get that into your head. That is more or less produced by locality. You can take the corn from Illinois here, and have many more barren stalks than on the farm where it was raised. The barren stock is pretty hard to weed out. In our experimental work we have reduced it from 20 per cent to 9 per cent. It can be kept down, but not estimated.

A Member: What is the cause of smut?

Prof. Christie: It is a disease; it starts on the stalk, and then passes down to the stubble that lies on the ground all winter, and in the spring there are millions of microbes ready to start work, and they spread through the air, and grow very rapidly. The way to handle it has not been solved. One farmer will clean his fields, but his neighbor right across the way may neglect to do so, and it spreads across again. If we could get everybody to gather it up and burn it as rapidly as it appears, we could probably soon bring it within control.

Prof. Fuller: Mr. Christie, in addition to increasing the yield per acre, have you given any attention to increasing the protein or the starch?

Prof. Christie: We have been working for four years on increasing the yield, and I am afraid we have thought less about the protein than we should. In fact, we have less protein now than we had before. We find the alfalfa and red clover so much richer in protein, that we have confined our attention altogether to increasing the yield.

A Member: What do you know about corn blight?

Prof. Christie: I don't know anything about it.

A Member: Is there any difference in the protein in the white and yellow corn?

Prof. Christie: The result of several hundred tests at our Experiment Station is about the same. This question of the food value of white corn being better than the yellow, or the yellow being better than the white, is to be taken approximately. The only way I can solve it is palatability. For instance, we take dried chips or shingles, but we like them, and we thrive on them; then we take them to a chemist, and he tells us there is nothing in them. Now, here we have a corn that is hard and flinty, and the cattle do not like it because it is so hard on the mouth, and we come to

the conclusion that it has more protein in it, when, as a matter of fact, it is just the other way.

The hour is growing late, and if you have nothing further, I thank you for your attention. I assure you that it is quite a long time since I have talked to people after nine o'clock. You must have been interested, or you must have stayed out of courtesy. Either way, I thank you.

Prof. Van Norman: Mr. Smarzo, the scorer of butter, is still here, and if any of you wish to see him, you can do so afterwards on the outside. We will now read the prizes awarded to the corn, and afterwards auction it off.

Mr. Bayard: The following is a list of the corn prizes:

100 Day.		
Prize. No.	Name.	
1st	Harry C. Trexler, Allentown.	
2nd	Wm. N. Lynch, Eliotville.	
3rd	G. A. Trimmer, Mechanicsburg.	
4th	J. F. Lantz, Wyewook.	
5th	Ralph McCullough, Brookville.	
6th	G. W. Tilton, Claysville.	
7th	Walter E. Stiger, Hepburnville.	

Flint.		
Prize. No.	Name.	
1st	W. H. Nunn, Muncy.	
2nd	John A. Ayers, Gillette.	
3rd	F. O. Van Nest, Liberty Corn's.	
4th	M. W. Force, Brooklyn.	
5th	Harry Rockwell, Canton.	
6th	M. W. Force, Brooklyn.	
7th	S. O. Jones, Athens.	
8th	S. O. Jones, Athens.	
9th	A. T. Holman, Millerstown.	

Yellow.		
Prize No.	Name	Dent
1st	J. H. Brinton, Gap P. O.	

OFFICERS OF THE DAIRY UNION

President, H. E. Van Norman, State College; Vice President, G. M. Carpenter, Wilkes Barre; Secretary, W. E. Perham, Niagara; Treasurer, M. E. Reeder, Muncy. Directors, J. H. Reichert, Scranton; M. P. Shoemaker, Greensburg; E. E. Jones, Harford; Lewis Stenson, Coatesville; Henry Palmer, Avondale; L. D. May, Granville.

This report is endorsed by the three members of the committee, W. C. Norton, G. C. Watson and John Sharpless.

On motion, duly seconded, this report was accepted.

Mr. Norton: I don't know whether it would not be well to do this in a little different form. I think it would be better for the motion to be offered that the report of the Committee be accepted, and the Secretary cast the vote.

Secretary Critchfield: I make that motion.

Seconded, and carried.

The Secretary casts the vote for the officers, and directors, as instructed.

Prof. Van Norman: I was instructed yesterday to appoint a Committee to confer with the Governor relative to Dr. Pearson. I will appoint these members: Messrs. J. H. Reichert, W. G. Powell, J. F. Lantz, E. S. Bayard and M. P. Shoemaker.

Is the Resolution Committee ready to report? This is to be a joint report of the Dairy Union and the Live Stock Breeders' Association. This Committee has worked together, and will report their conclusions together.

2nd	8	Lee R. Scott, Burgettstown.
3rd	21	Not identified.
4th	25	Pusey Cloud, Kennett Square.
5th	12	G. F. Erdley, Lewisburg.
6th	6	Jacob Bidon, Newport.
7th	50	H. S. Harrison, Canonsburg.
8th	40	Not identified.
9th	26	John L. Bashore, Mechanicsb'g.
10th	1	Wm. M. Harrison, Philadelphia.
11th	47	Samuel McCreary, Volant.
12th	22	J. P. Dentler, Turbotville.

White.		
Prize. No.	Name.	
1st	L. W. Kintigh, Westmoreland Co.	
2nd	G. A. Trimmer, Mechanicsburg.	
3rd	W. M. Thompson, Uniontown.	
4th	R. W. Anderson, Fawnsgrove.	
5th	H. W. Anderson, Stewartstown.	
6th	Mrs. S. B. Fritz, Duncannon.	
7th	Not identified.	
8th	Nelson Poorbaugh, Mt. Pleasant.	
9th	B. C. Mitchell, Brandamore.	
10th	Sam'l H. Broomall, Cochranville.	
11th	John A. Heckman, Williamson.	
12th	Jos. C. McCann, Fredonia.	

Mr. Bayard: The corn will now be auctioned off; I hope you have come prepared to bid high figures for it.

After the corn had been disposed of, the meeting adjourned until Friday morning.

Friday Morning, Jan. 25th, 1907.

The meeting came to order at 9 o'clock, with Prof. Van Norman in the chair.

Prof. Van Norman: The remainder of the meeting will please come to order, and we will proceed with the business on hand. The Dairy Union has some business to dispose of, after which the stock breeders will be ready to go on with their work.

Mr. Norton: I have the following report to offer for the Committee on Nominations:

Report of the Committee on Resolutions.

The joint Legislative Committees of the Pennsylvania Dairy Union and the Pennsylvania Live Stock Breeders' Association report that we recommend the adoption of the following Resolutions:

Resolved, We recommend that the trolley lines be given the right to carry freight, without any limitation as to the kind or quantity, subject, however, to municipal regulation within borough, town or city limits, and we further recommend that they be given the limited right of eminent domain, as follows: Whenever the right of way has been secured from eighty per cent of the property holders, then the balance of the right of way may be taken by the right of eminent domain.

Resolved, In townships where road tax is paid we recommend that the 15 per cent paid by the state be increased to an amount not to exceed 50 per cent.

Resolved, That we recommend the passage "An Act to establish a State Fair Commission to provide for holding an annual State Fair, and making an appropriation therefor."

Resolved, That the Dairy Union and Live Stock Breeders' Association view with approval the development of the Pennsylvania State College along agricultural lines, and the evidence of the adoption of the policy on the part of the trustees of that institution, for the promotion and extension of agriculture and dairy education to a greater extent than heretofore.

Resolved, That since the protection of animals from disease, and the development

of the veterinary science are of vital moment to the agriculture of the state, and the health of the people, we deem it important that the Veterinary School of the University of Pennsylvania shall be developed so that it may be adequate to meet the requirements of the Commonwealth in relation to veterinary education.

Resolved, That we recommend that the legislature make liberal appropriations for the further building up and support of these institutions.

Whereas, It is evident that the health of cattle has a very important bearing on the wholesomeness of the milk supply and that general questions of stable hygiene are of weight in this connection and must be considered and satisfactorily handled if this inspection is to have the sanitary and market results that may fairly be expected, be it, Resolved, That in any plan for dairy inspection that may be formulated, there should be incorporated some project for effective co-operation with the State Veterinary service.

Resolved, That in any general comprehensive law providing for dairy inspection and control, there should be provision for the definition and protection of such terms applied to milk as Certified, Pasteurized, Sanitary, Nursery, Pediatric, Absolutely Pure, Veterinary inspected, etc., etc., or in general, that milk shall not be misrepresented by false labels or false branding.

Whereas, It is a common practice in some sections of the state to purchase milk by dry measure, and sell by liquid measure, which is an injustice to both consumer and producer, be it,

Resolved, That it is recommended by this joint meeting that legislation be enacted providing that the standard liquid gallon of 231 cubic inches shall be the legal basis for the purchase and sale of milk and cream.

Whereas, The farmers and dairymen of Pennsylvania were largely instrumental in securing the enactment of the beneficial dairy legislation now in force; therefore, be it,

Resolved, That the members of the Pennsylvania State Dairy Union are strongly opposed to any change, amendment or repeal of the Acts of the Assembly, regulating the manufacture and sale of Oleomargarine, approved May 29, 1901, and the act regulating the manufacture and sale of renovated butter in Pennsylvania, approved July 10, 1901, respectively.

Whereas, It is a common practice when cream is purchased on the basis of its fat content, to measure with a pipe the sample used in determining its fat content, and

Whereas, This gives incorrect results, and injustice to one or both parties concerned in the purchase; therefore, be it,

Resolved, That the Pennsylvania Live Stock Breeders' Association, and the Pennsylvania Dairy Union do recommend the introduction of a bill in the present session of the Legislature, making the weighing of the sample of the cream compulsory.

Resolved, That the Pennsylvania Dairy Union notes with satisfaction the increased attention given to dairying by the United States Department of Agriculture.

Resolved, That we believe that the great dairy interest of the nation are of sufficient importance to be represented by a Bureau of the United States Department of Agriculture, and we respectfully urge Congress to raise the rank of the Dairy Division to that of a Bureau.

Resolved, That copies of these Resolutions be mailed to the Hon James Wilson, Secre-

tary of Agriculture, and to the members of the Committees on Agriculture of both houses of Congress.

Signed by the members of the Committee on Resolutions, Messrs. Reichert, Shoemaker, Palmer, Comfort and Leonard.

Mr. Bayard: I would like to add one Resolution to that list, and that is in regard to the stallion law Wisconsin has found so satisfactory; I will read it:

"Resolved, That the Dairy Union and the Live Stock Breeders' Association endorse a stallion law similar to that of Wisconsin." This law to be introduced in the Legislature.

On motion, duly seconded, it was agreed to add this resolution to the list presented by the Committee.

Prof. Van Norman: Will you act on these Resolutions as a whole, or in part?

Mr. Norton: I move that they be adopted as a whole.

Mr. Bayard: I would like to hear a list of the Resolutions.

Mr. Norton: Will the Chairman please read the subjects?

Prof. Van Norman reads the first section, relating to trolley freight lines, and the granting of the right of eminent domain to trolleys.

Mr. Bayard: I move that the first resolution be adopted.

Mr. Powell: I favor the adoption of that Resolution, but if that were put in the platform of the Republican party there would probably be some opposition, on account of the opposition to railroads. Now, we do not deny the same right to the trolley that the railroad has, but just as soon as they have the right of eminent domain, they will run right through the fields, without any regard to the people. Now, the trolley car is just as dangerous as the steam car, and I think it would be well to insert a provision that the rights of the people be cared for.

Prof. Van Norman: Will they not be taken care of by law?

Mr. Powell: Yes, but why not put it in the Resolution? We are doing everything for the trolley, and nothing for the people, and we should do something in the interest of the people.

Mr. Bayard: How would you get them off the road without giving them the right of eminent domain?

Prof. Van Norman: The Resolution provides that the trolley cars shall be given the right of eminent domain only with the consent of 80 per cent of the property holders.

Mr. Powell: In a few years there will be as much opposition to trolley lines as there is now desire for them. At present the railroads have a monopoly of the freight, but it will not be long before the trolley line freights are controlled by the moneyed interests, and I think we should consider the interests of the people, as well as of the trolley. I am favorable to all these things—railroads, trolley lines, telephones—but I think we should protect the people, too.

Mr. McSparran: It seems to me very difficult to exactly define the rights of the people in this matter. Under the common law the rights of the people are well taken care of, and when they are imposed on by any corporation, they have redress in the courts.

Secretary Critchfield: I only want to say that the rights of the people are cared for by the local courts. If the rights of the people are infringed upon they can go into the courts, and there it is decided what damages they have received, and what they shall be given for them.

Prof. Van Norman: Are you ready for the question?

There being no opposing votes, the Resolution was endorsed as read.

Prof. Van Norman reads the second section, relating to the payment of road tax by townships.

Mr. Norton: I think we had better cut out that word "exceed." I move that it be so amended, and we cut that word out.

A Member of the Committee on Resolutions: There is a special object in putting in that word. We are demanding 50 per cent, nothing less, and it is a question if it can be passed if we want 50 per cent of our road tax paid by the state. I, myself, rather question whether it is wise to use the word, but we don't want to reduce it.

Mr. Norton: I don't take it that we do reduce it. The taxation in our township will be just the same as it was before. If the township rate is \$2,000, the state gives you \$1,000. This law is not to reduce this \$2,000, but it is to add this \$1,000. Mr. McLane has the bill in charge, and his idea is not to reduce your home tax, but to add this to it. His bill calls for a flat 50 per cent, and, therefore, I think it should be endorsed.

A Member of the Resolution Committee: Our township this year raised \$8,000; then you say that should stand at \$8,000?

Mr. Norton: Yes, sir; I was a member of the house, and know the intention of the members having the bill in charge.

A Member of the Resolution Committee: Is it not a fact that there is so much money in the state that they hardly know what to do with it? Why not give the townships some of it, and reduce the taxation?

Mr. Powell: There is danger in that resolution. One township will raise \$5,000, and another \$1,500, and now the idea is that each gets 50 per cent of it. That should be knocked out where we say that they shall have 50 per cent of what each township raises, because some townships raise so much more than others.

Mr. Norton: I am a supervisor in our township, and I know how our township feels, and I would say that we should endorse it as it reads, but I feel that it will hamper Mr. McLane, of Crawford, who has the bill in charge if you leave that word in.

Mr. Bayard: There is no objection to Mr. McLane's bill, and I move that we substitute that bill for this resolution.

A Member of the Resolution Committee: I don't know anything about that bill, and I would not be in favor of endorsing any bill that is not brought regularly before this body.

Mr. Norton: This bill comes up before a body of 20 men before it reaches the house, and if a bill comes on the floor of our house endorsed by 20 men, I think we can safely endorse it. If the bill were not a good one, it would not receive the endorsement of these 20 men. We have never had as good a Road Committee as we have had this year. This bill will call for the addition of 50 per cent to what each township raises.

A Member of the Legislative Committee: I suppose that the legislature cuts out some of the bills that they do not want any special discussion on?

Mr. Norton: Well, yes; but no recommendation that carries with it an appropriation.

On a vote being called for, it was finally agreed to endorse the bill as read.

The remaining sections, on being read one by one, developed no discussion, and were

passed in the order named by motion regularly made and seconded.

Prof. Van Norman: That is all the resolutions, and if there is no further business, the President of the Breeders Association will take the chair.

Whereupon Mr. Norton takes the chair, and the business of the Live Stock Breeders' Association is taken up.

President Norton: Is the Committee on Nominations ready to report?

Mr. Powell: I would say that this Committee has decided, after consulting with many of the members, to let well enough alone. We therefore, make the following nominations of the old officers:

President, Hon. W. C. Norton, Waymart; First Vice President, Dr. Leonard Pearson, Philadelphia; Second Vice President, M. P. Shoemaker, Greensburg; Secretary, E. S. Bayard, Pittsburg; Treasurer, J. F. Lantz, Wyebrooke.

Executive Committee: W. G. Powell, Shadeland; W. N. Clark, Claridge; D. Norman App, Selinsgrove; Lee R. Scott, Burgettstown; George C. Watson, State College; James Blair, Hartstown.

Legislative Committee: Hon. W. C. Norton, Waymart; E. S. Bayard, Pittsburgh; Dr. Leonard Pearson, Philadelphia; Dr. Thomas Turnbull, Allegheny; H. W. Comfort, Falsington; R. L. Munce, Canonsburg; J. H. Relichert, Scranton; S. E. Nivin, Landenburg; Henry Palmer, Avondale.

Transportation Committee: Thomas E. Orr, Beaver; Dr. J. Cheston Morris, Philadelphia; W. F. Shrum, Adamsburg; Jas. T. Fleming, Belleville; J. Grier Dain, Malvern.

Committee on Fairs: W. C. Black, Mercer; James Blair, Hartstown; J. L. Henderson, Washington; J. D. Detrich, Flourentown; L. D. May, Granville Centre; W. E. Perham, Niagara; J. D. Nevius, 344 Mint Arcade, Philadelphia.

On motion, duly seconded and carried, the report of the Committee on Nominations was accepted.

Mr. McSparran: I move that the President of the Dairy Union cast the vote for these officers.

Motion seconded and carried. Prof. Van Norman thereupon casts the vote for the officers as named by the Committee on Nominations.

Prof. Van Norman: Is the Auditing Committee of the Dairy Union present? If not, I might say that we are in a hole about thirty dollars.

A Member of the Auditing Committee: We are behind \$40.73.

Prof. Van Norman: Will you accept this informal report?

On motion, seconded and carried this informal report was accepted.

President Norton: Is there any one in the room that has anything to present to the Convention?

Mr. McSparran: It seems to me a shame that our Treasurer should be expected to do the work and pay his own postage. The Secretary, being a newspaper man, it does not matter so much, but Mr. Lantz spends a great deal of his time in attending to matters pertaining to the Association, and I think he should receive some remuneration.

President Norton: There was a balance of \$64 in the Treasury last year, but this year the bills are not in yet, and we don't know where we stand. I would say that I feel as Mr. McSparran has expressed it, that Mr. Lantz should have some remuneration, but I don't see how we can afford it. From the time that we organized in Pittsburg, eight years ago, we have received barely

sufficient to meet expenses, and we have been working for the good of the cause. I know that whatever Mr. Lantz does, is done cheerfully, and that he feels with us that it is for the common good.

Gentlemen, I thank you for re-electing me

THE CORN SHOW

THE CORN SHOW.

The corn show brought out by prizes offered was a highly creditable one for the first exhibit. The inexperience of the management led to some errors in the conditions and directions given exhibitors, this, no doubt, being responsible for the fact that some of them omitted all marks of identification from their corn. Every effort was made to identify these exhibits and usually with success, but a few could not be identified either from the letters of transmittal or from the packages. We much regret this and must plead our inexperience in such matters. The corn was duly numbered and arranged on tables for exhibition and all marks of ownership removed, so that the judge might have numbers only before him.

THE ALFALFA SHOW

Only a few samples of alfalfa were submitted, the competitors being Lee R. Scott, Washington county; T. Maxwell, Westmoreland county, and W. A. McCoy, Mercer county. The prizes were awarded in the order named by Joseph E. Wing, the alfalfa apostle of the east. Letters from the winners appear below, giving their experience in growing the crop.

Statement of W. A. McCoy.

Dear Sir:—I will write you a short description of my experience with alfalfa. In the spring of 1889 I brought a peck of seed from Canada and sowed it with oats on gravelly ground, which was rather poor and I never saw but one stalk. In 1894 we sowed a small piece which had been in corn the year before. We sowed it on gravelly ground without any nurse crop and without any manure or lime. It came up thin and grew slowly for a year or two and the chickens ate it out.

In the spring of 1900 we sowed one peck of seed in the orchard where it was shaded, the ground had been manured and covered with wood ashes the year before and planted in beets and carrots which were well worked and kept free of weeds, then in the spring of 1900 the ground was plowed the last of May without any manure or lime and seeded to oats and alfalfa. The oats were cut at the usual time and nothing done to the alfalfa until the next year, when it was mowed twice and twice each year until in 1905, when it was mowed three times and three times in 1906. The first cutting of 1906 was on June 28th, the second on August 16th, and the third on October 10th. It is not a good stand all over the patch, but is getting thicker every year and the best of it will make about one ton to the acre.

The spring of 1906 we sowed two acres of a piece of ground which we had worked in roots for about four years. The ground was a sandy loam, had been well manured and kept free of weeds and was plowed on the 5th of May and harrowed every week until the last of June, when we had it very fine. We then put on 30 bushels of stone lime to

to the Presidency, and I trust we shall continue to work together to better our organization.

If there is no further business, the meeting stands adjourned.

It was found that the entries in the regular classes numbered: Yellow Dent, 60; White (and White-Capped) Dent, 32; 100 Day, 7; Flint, 9; a total of 108. Besides there were a number of entries of corn not provided for in the classes, such as pop corn, red corn, sweet corn, and extra samples submitted by those who made only one entry in competition. The total reached about 125 exhibits of ten ears each and included many different types and varieties.

The corn was judged by Prof. G. I. Christi, of the Indiana Experiment Station, whose awards were as given elsewhere. The prize corn was auctioned off and what was not wanted by bidders was sold to grain dealers, as all the corn exhibited became the property of the Association.

See awards on page 42.

the acre and harrowed it again and dragged it. Then we got 10 bushels of soil from the old patch and scattered over this to try the effects of inoculation on it. Then we sowed 21 pounds of good seed on it with a wheelbarrow seeder, one-half sowed one way and one-half the other way. Then we harrowed it with a smoothing harrow and dragged it with a plank drag. It came up very quickly and evenly, but the weeds grew faster than the alfalfa so we mowed it the first of July and again in August and September.

By this time the alfalfa was growing nicely, so we left the fall grass and other weeds grow until the frost came and they make a nice covering for the alfalfa, and I have never seen a nicer stand of any kind of clover. It is thick and strong and even and I think can be cut three times next year.

The field we had in corn in 1906 is very gravelly and part of it was manured last spring before we put it in corn. We will plow it in the spring and top-dress what was not manured last year, then spread about 30 bushels of stone lime to the acre, then inoculate it with soil from the old patch. We will sow two bushels of oats and about 20 lbs. of alfalfa to the acre and see what it will do.

I think we can grow alfalfa in Mercer county as well as anywhere if we thoroughly cultivate and manure and lime our land.

Statement of T. Maxwell.

If I live another year I will load up for the alfalfa contest. I am going to sow three acres more. I can't do without it. My cows won't eat timothy hay any more. Have a good silo and the alfalfa hay stretches the hide on the cows. Twelve years ago I got the alfalfa in my head. At that time we had no writings on it, no speakers on it. I sowed a bushel on my wheat in the spring. Of course it was a failure, but I learned. Some little came around the corners of the field and sides where there was no wheat. There are some fine plants, grew large. I saw it would grow. My next attempt was four years later. I sowed a bushel on four

acres of oats, rolled the oats, sowed the seed, gave it one stroke of the harrow. Oats and alfalfa came up fine. When the oats came in head the alfalfa was six and eight inches high. I thought I was too poor to cut the oats for hay, but by the time the oats were ripe the alfalfa was yellow. Oats threshed 62 bushels to the acre and the alfalfa was gone. The next I sowed it as a

crop, plowed, disked, harrowed, rolled and sowed, one stroke of harrow. That was the time I struck oil. Last fall if it had not been so wet I would have had a fine fourth crop. I have only a small farm, 40 acres, handy to Valley Camp on the Glade road. I haul the Kittanning express on B. and A. V. R. R. T. Maxwell.

ADDRESS OF PROF. VAN NORMAN, PRESIDENT OF THE DAIRY UNION

The president's address is often looked upon as a necessary evil, and it may be so. I want, in my remarks this afternoon, to call the attention of the dairy interests—and when I say "dairy interests" I mean that use of the term which includes butter making, milk shipping, cheese making, breeders of dairy cattle, in fact all the dairy interests of the state—to the possibility that stands before us.

The Dairy Union has seen the milk shipping business of this state very largely increased; at the same time, there is an increased demand for more of the best butter, and to the dairymen who are making the butter, I want to say that if they would increase their product and get a good price for it, there are three things to be taken into consideration: First, that you make a good article; second, that you make it good from day to day, uniformity is one of the greatest factors in success; and, thirdly, that you have good facilities to get the same to market. I have been impressed with the demand there is for a good article. The consumer asks, "Where can we get good butter?" and "Where can we get good cream?" The ice cream people are going further and further from the large cities to get their cream, and in the smaller towns there is an increasing demand for good ice cream and for good cream. There is more and more ice cream being used, and what used to be a luxury has become a necessity, and every housewife is appreciating, as she should, the value of good ice cream as a dessert.

The demand for cream for ice cream raises the question whether that is the best way to dispose of our milk. It is, if we use the skim milk wisely. If you do, it usually makes the highest priced market we have for the cream. I would ask you, therefore, to consider that in the sale of cream for ice cream there is a marked growth and a growth that will continue for some time.

Our city consumers are losing faith in the integrity of their milk men in a great many cases, and they want somebody to certify whether they are getting a good clean milk, and there is, consequently, an increased demand for certified milk. But we will hear more about that later in the evening, so I will simply call your attention to it, that at the present time the public wants more milk that is pure, and clean, and free from the bacteria of filth and disease. I tell you, that the city people, with their babies to be fed on the bottle, find it a very serious problem to secure good milk. An important question to the father and mother is to get a milk that can be fed to growing children with safety, and it is worth our while to let them know that we have such an article to offer them, and to get their orders. I think there should be a difference in price between a good article, and an inferior article. In many cases the milkman with a

good article is getting as much as it is worth. I think our consumers should refuse to pay so much for the poor milk, and pay more for the good. This will make the milkmen discriminate. This question of raising the quality, and getting the consumer interested in it, is one of the problems of the milkmen. The only way to do that is to produce a good article, and then insist upon having a good price for it.

Now, a word to our breeders of dairy cattle. I am glad we are here with the Breeders' Association. I wish my colleagues in the dairy work would heed the teachings of the Breeders' Association regarding pure bred stock. I want to impress upon these men that one of the most important means of raising the standard of our dairy cattle is by getting pure bred sires into the common dairy herds. Many years ago our breeders of beef cattle had an over supply of registered beef bred bulls. Some enterprising man took a lot of them to the range and from them has developed a class of steers that is today ahead of those in many of our older states and created a market for thousands of registered beef bred bulls. Why? Because they have had pure bred sires for several generations and their offspring show the influence. If you go into our large packing houses today you will see many animals that show the marks of the pure blood of the beef breeds. If our common dairy herds can be improved by putting in pure bred sires, then the owners of registered dairy cattle should be among the first to encourage the pure bred sires.

We want the largest amount of milk for a given amount of feed. The average now produced in this state is 150 to 160 pounds of butter fat per cow per year. The average in our college herd for the last six years, running from 22 to 32 cows per year, is 270 pounds per cow. We do not have pure bred cows, but for 10 or 12 years the college has used the best pure bred sire they could get. Some times they have been hindered by lack of money; sometimes because they could not get what they wanted, but they have always used the best sires they could get, and the result is apparent in the yield of fat. I suppose these results could be duplicated on every farm in Pennsylvania, but sometimes we farmers don't know what is good for us until some one comes along and sticks it under our noses. Then we see the advantages of breeding pure bred cattle and of getting the record of what the cows are doing, and of bringing these things to the notice of the farmers. If there is any man who wants help of this kind most, it is the man with scrub cows. When we can get in touch with him, we will be doing just what the man did who went out on the Texas range with his surplus of registered bulls to improve the beef cattle from

the plains. Often you don't know what to do with a bull calf, so you kill him or give him away. If he has a mother that has a good butter fat record, that is the last thing you ought to do. It will pay to raise him, and get more of the pure bred sires into the common herds of the state.

I want to urge upon you the necessity of keeping a record of the butter fat of each cow. You have to keep that cow 365 days in the year. What does she give you for it? I can show you records of men who are not getting a dollar's worth of milk for a dollar's worth of feed, and I have seen cases where they only received 99, or 70, or 80, or 60 cents' worth for a dollar's worth of feed. They have the same kind of feed, and they have the same kind of stock; what they need is a record of what each cow is doing, so as to eliminate those from the herd that are not paying. There is not a man of you but would require of a man five dollars in change for a five dollar bill, yet there are many of you here who are keeping cows that are giving \$30 worth of fat in a year in return for \$29 to \$32 worth of feed, when you might be getting \$50 or \$60 worth. Keep your records, and then add a little more care in the handling and feeding of that cow, and see what the result will be.

To go back to the Dairy Union a little bit, I have two or three suggestions to submit: I hope the Nominating Committee, in selecting the officers, will bear in mind to select men who will help push along the work, so that it will develop into larger usefulness. The only object of this association is to help the dairy interests of the state. It is by developing the industry as a whole that we help ourselves. You know we are all a little selfish, and what helps the union helps us. One man may not be able to do much, but if each man is willing to do his little part we will have strength and energy enough to carry the great work along. I would like to see another year, two days given up to the discussion of strictly dairy subjects, such as butter tests, pure bred herds, scrub cows, cheese making, butter making, starters, butter scoring, etc., all of which we can use to advantage.

I would like to see a large exhibit. It was with fear and trembling that your officers this year decided to have an exhibition of dairy machinery and of dairy products. The machinery manufacturers responded, and have sent us an exhibit. Now, you want to do your part by showing your interest in them; when you want to buy machinery, buy from them, from the people who have sent their exhibits here.

We are disappointed that there are not more dairy products. We did not get our advertisements out early enough I fear. Next year we will do better. Many who have a market for a medium grade article will not be able to hold it if some one offers their customer a better article at the same price. When the market is flooded it is the man with the best goods who gets the top price.

The milk exhibit will be spoken of by a man who is making the examinations. I would that we might see an exhibit from every creamery.

In our meetings there has been much stress laid on the thought that you cannot make good butter from poor cream. If you have patrons that are delivering good milk and cream send samples of it in to compete at this show.

I want to express my appreciation of the efforts of the Vermont Farm Machine Co. in getting our exhibits from their customers. They offered special prizes to the makers

of butter who use their machines, and I believe that the exhibit of butter here is largely due to their efforts. Let us see what we can develop next year in this line.

I would like to call the attention of the farmers to the desirability of forming associations in your neighborhood, for the testing of your cows and securing the records of the cows in your district. Three different creameries have stated that they are willing to pay \$100 each to have a man come there at stated periods, say about three times a month, and test the samples of milk. I am not prepared to say today just what I can do, but if eight or ten creameries got together in this way, the expense on each one would be very slight, and I would get the man and guarantee his work.

Now, just a word regarding the butter. I fear that some of you who are exhibitors here may be disappointed in the scores. I selected the judge, and he has judged it on the basis of the market requirements. If some of you have a low score, and are getting a top-of-the-market price for it, don't be discouraged, but go ahead and see if you cannot secure a high score and yet please your customers also.

I submit the following recommendations for your consideration:

1. That the Dairy Union should work for the passage of laws that will secure the registration of creameries, cheese factories and similar establishments, together with sanitary oversight of such places and the farms, where products intended for sale are produced.

2. The establishment of a great state fair commensurate with the agricultural interests of this state, the value of the agricultural products being greater each year than the combined value of coal, iron and oil produced annually.

3. A law defining certified milk and providing for the proper use of the term.

4. The securing of such appropriations to the Pennsylvania State College as will enable the Dairy Husbandry Department to have several traveling instructors to assist the cheesemakers, butter makers and milk producers in improving the quality of their products and stopping many of the leaks that now exist, also to gather such information as will enable the department to be of greater use to the dairy interests of the state.

5. That Professor Harry Hayward, who did so much to help forward the work of this Association, be made an honorary member.

6. That Article 3 of our Constitution which now reads, "Any person interested in dairying, whose name is approved by the membership committee may become an active member by subscribing to the Constitution and By-Laws, and by payment of the annual fee of one dollar," be amended so as to read as follows:

"Any person, firm or agricultural organization interested in dairying, may become an active member of the Union for the calendar year upon payment of one dollar, or may become a life member on payment of ten dollars, or after having paid ten annual membership fees."

"Any agricultural organization holding an active or life membership in the Dairy Union may list its members as associate members of the Pennsylvania Dairy Union for the calendar year on payment of 25 cents for each such member, and shall receive as many copies of the annual report and other publications as it has associate members. Associate members shall have all the privi-

leges of membership except voting and holding office.

Any person rendering this Union noteworthy service may be elected an honorary member by unanimous vote at any regular meeting. Honorary members may not vote or hold office, and shall be exempt from dues."

Now, here is the point, that agricultural societies may list their members as associate members of the Dairy Union. Many societies of this state which are interested in dairying, are not represented here, because it is too far for their people to come,

ADDRESS OF DR. WM. HART DEXTER

We are all very sorry, I am sure, that Mr. Webster is not able to be here today. It becomes my privilege to stand in his place. I wish to make your acquaintance on the right basis and to have you understand, in the first place, what the work of the Dairy Division at Washington is. From the very excellent work that is being done with limited means at your own State College, and realizing after the address of yesterday by Dr. Hunt, how much more is needed, I am sure that you are in a position to appreciate the readiness of "Uncle Sam" to assist the varied interests of the different states without interfering with your state rights to do in your own state what your institutions ought to do.

The Dairy Division of the Department of Agriculture at Washington aims to be, and is to a large extent, a clearing house for ideas. It was not primarily an institution for research; it is not intended to do other people's work for them, but it was organized to learn the most successful dairying methods from the different parts of this country and other countries, and to learn also the dairy needs of our own country especially, and to tell the better ways of doing the things that need to be done, so that all the people who need to do these better things could learn how.

During the last year the Dairy Division has doubled its working force and improved its organization, so that now we have the different classes of investigations provided for, as you will see by this leaflet (showing leaflet) outlining our work, and telling you of publications of interest to dairymen, many of which you can have without charge if you ask for them.

You will learn of some of our market milk investigations this evening in connection with the report on the milk and cream that has been sent here. We are making a study of the dairies that supply Washington with milk. There are about 900 of them. About 300 of them have been examined already with the use of a score card which indicates a standard of excellence. This standard is such as can be adopted by any city, and we shall be glad to help any city that wants to try it. Cleveland is already trying it with encouraging results. The plan is such that the producers and dealers can find their records with the Board of Health, and can see there where they fall short and how to increase their rating without materially increasing their expenses. Their attention is called to points which they may have overlooked, or points wherein their workmen have not carried out their instructions.

We would be glad to assist you in the work of inspection which your President has suggested, and if desired would send you a man to go with your inspector as has been suggested, to make the first tests.

or for their Grange, or Farmers' Club, or whatever organization they may have, but by the payment of the small fee of 25 cents they become members, and receive the publications, and their interest is aroused, and the work spreads. I have also provided that any organization may become a life member upon payment of ten dollars.

I think this is enough president's address for one time, so I will now make place for Dr. Dexter, of the Dairy Department at Washington, who represents Chief Webster. Chief Webster is unable to be with us in person. The talk on alfalfa will come later.

We have a butter expert at work here examining the butter, scoring it according to the market value and explaining its defects. He has shown at the creamery session how to determine the amount of water in butter, using the new rapid method and device invented by our Mr. C. E. Gray, which promises to do for butter what the Babcock test does for milk. This is a device patented by the Department of Agriculture for the benefit of the public.

Our cheese experts are at work in Connecticut and Wisconsin with the purpose of ascertaining the best methods of making cheese of the European and American varieties. Swiss cheese is now produced in Wisconsin in almost the same form as in Switzerland. Camembert cheese is successfully made at the Agricultural Experiment Station at Storrs, Conn.

We are also pushing southern dairy investigations under special appropriations by Congress, so as to ascertain the difficulties peculiar to that section and overcome them. Our field agents visit the dairy farmers, manufacturers and dealers, co-operating with them in the introduction of improvements.

We have a building expert at work so that we are able to recommend suitable plans to those who are about to erect dairy buildings, and we sometimes furnish sketches of such plans so that we may learn in return what are the actual benefits of such improvements, and then pass them on to others.

We have our dairy laboratories at Washington, where we are now ready to make such investigations as are necessary to supplement the lines of work carried on at various outside stations.

In cooperation with the State College of Missouri, we are conducting investigations of the composition of normal milk as affected by the age, feed, breeding and lactation of the cow, and the nature of her care and surroundings. We want to find out what milk really is, and how it varies naturally.

We are inspecting the manufacture and sale of renovated butter throughout the country, as required by Congress.

The Division now has 46 employees, 31 of whom are scientists, and seven engaged in inspection work. Write us fully and ask us any question that you would like to have us answer, and we will do all that we can from Washington to help you.

May I say a few words of encouragement to the dairymen as to the general advantages which it seems to me are not appreciated as highly as they should be. Advantages which belong to the occupation of the farmer, especially of the dairy farmer? I find that young men in a great many places have an entirely false and unworthy notion of what farming really is, what it really affords, for

example, in the way of independence, of opportunities for profit, and for social pleasure and comfort. You, with your broader views, I presume, are already doing missionary work trying to raise the lamentably poor conditions of some of the farms around you, as you see them. Our boys should learn from us the advantages of the dairyman's independence of living as compared with the constant limitation of the freedom of men in other employments. We should show our girls and boys and our neighbors how really less capital is required to start profitably in the business of dairy farming than in almost any other occupation. I wish we might appreciate also the advantages of the dairyman's home, in the fact that all the members of the family can be occupied in some profitable way, without unnecessary hardship, on the dairy farm. I wish we might appreciate the fact, and tell our neighbors how delightful is the work of the dairy farmer; how life in the open air and the interest of being with living things gives health and vitality to body and mind, and makes homes glad. Perhaps we are not in the habit of thinking enough about these things, and we forget to speak often about them to our boys and girls. I wish we might bring it home to them that our occupation really develops the most desirable habits of industry and economy and good morals. I wish we might impress upon them that surroundings most helpful to manhood are found on dairy farms. I wish we could make them see how especially calculated is dairy farming to show that labor is honorable, and that it is worthy of all their best efforts. And, standing here in the State Capitol, I am impressed with the idea of the special opportunity which comes with dairy farming, of honorable participation in political life of the better sort. No occupation offers greater possibilities of political leadership than dairy farming.

Your President has stated the importance of knowing the needs of the dairy. We should make these needs better known through the newspapers. Perhaps some of you noted, as I did, the small importance that seems to be attached by the city press to this meeting. The only indication that I could find in the Harrisburg papers this morning that this convention is being held, was a small item in one of the papers, barely mentioning it, and saying that the program was being followed; yet the Governor was here and presided for an hour! Now, the dairy paper has a large share in the instruction of your boys, and I mention this because of the importance of bringing our work properly before the representatives of the press.

I will only urge a few suggestions as to the special advantages for dairying in Pennsylvania, and then I will stop, because I know you are anxious to hear the others who are to speak at this session.

To the dairy farmer there is no more important question than that of the water supply. In this state with its mountain springs and many streams, water is abundant.

I was quite impressed at the creamery session this morning with the fact that your buttermakers seem already to have found sufficient markets for their product. Another advantage is the ease with which the markets near home can be reached.

You have the advantage over men in other forms of agriculture, in that you are turning the rough products which others sell into the finer and more finished products, less bulky and more valuable, so that you are

able in selling butter and cream from your farm, to do so at less cost for transportation, and thus, of course, to increase your total profits.

There is another advantage partly discussed yesterday by Prof. Hopkins, in the increased value of the land which comes from dairy farming. I could give you reports from other states, from Germany and from Denmark that go to show this. Where they raise one crop exclusively, such as tobacco or cotton, the farm loses its fertility. Some of the great farms of the west, once producing year after year enormous crops of wheat, have been brought by that system down to a yield of only eight or nine bushels per acre. But now, with dairy farming they are going up again to yields of 30 or 40 bushels, and to largely increased cash values for the land.

I would like to show you the value of the co-operative cow testing associations as developed in Denmark. The average increase in milk production after five years' trial was nearly 1,000 pounds per cow per year. The average increase in butter was 43 pounds per cow per year. I would like to discuss this with you at some length, but I will merely suggest that you join in the plan for co-operative testing as outlined by your President. We will help you from Washington all we can. I will not go into this argument with you, as I understand that Mr. Van Alstyne has already given an excellent talk on this subject; I will simply add an illustration: A little herd of 12 dairy cows up in New Hampshire produced in the course of a year a net profit of \$195.86—a small amount—but the profit from the best cow was within 30 cents of the combined profit of the first six cows in the herd. Four of these cows barely paid expenses. The owner of this herd might sell his six poor cows and lose no more profit than if he only sold his best one. So, unless you keep a record of each cow's production, you do not know where your profit comes from or just what you are doing when you buy or sell cows.

We, who know, are under obligations to do better things ourselves, and to raise the average of the farms around us. It is so pitifully low. In an average neighborhood into which one of our men went, he found that the average production of butter of the dairy herds supplying milk to the creamery was about 140 pounds per cow per year. After he went there and worked with them, the herd on which he was employed averaged 280 pounds of butter per year per cow, just twice the previous average of the neighboring herds. You will very likely find similar cases around your own home. Appreciate your opportunities to raise the standard in your community.

It is encouraging to know that a more scientific and reasonable understanding of the advantages of dairying is coming to both men and women. About a year ago I had the pleasure of talking with a woman who is most enthusiastically interested in supplying certified milk to the people of Chicago, having a farm a few miles up the lake, where she maintains sanitary conditions, and sets a fine example to many of the men engaged in supplying milk to the city. I also learn that Philadelphia is receiving a high quality of certified milk, a sample of which will be shown here tomorrow, produced by a successful woman dairy farmer, personally interested in the occupation which she adorns.

Let us go home from this Convention holding our heads high as successful dairy farmers, and while we congratulate our-

selves on the advantages we enjoy, let us urge our boys to go to the Agricultural Colleges and learn how to do things scientifically, and when they return with thorough prepa-

ration, let us join with them in practical application of the best methods to the advancement of our common interests.

SOME THINGS IN DAIRY FARMING

An Address Prepared for the Dairymen's Convention at Harrisburg, Pa., January 21, 1907, by Hon. W. D. Hoard, Fort Atkinson, Wis.

What does it mean to be a dairy farmer of today? This is a very important question to everyone down the long line of men who make up this great dairy industry. There is no man in that line who is as important to the industry, as the farmer back on the farm. On him must rest nearly every important consideration; the quantity of the product, the quality of it, for here he governs completely; the stability of it for if he finds it unprofitable the whole line wavers and is thrown into confusion. It is his honor, conscience, intelligence and watchful care that determines the quality of all the products of the cow. On quality depends consumption, and on consumption depends price and profit. All this depends on the man behind the cow. Then, besides, the character of the cow herself depends on his intelligence, discernment and enterprise.

The dairy farmer is the man at the switch sending the train along the right track or stalling it on a siding.

We have only to think this business of dairying out to its roots and branches to see that all the forces of education, law and public opinion should be enlisted to make the dairy farmer understand his own importance to the whole, and fully and thoroughly understand what it means to be a dairy farmer of today.

In thousands of instances the love of money, larger profit, better reward, is not enough to make thinkers of unthinking men, who keep cows and unprofitably fill the place of a profitable dairy farmer. And so there must be constant agitation of the subject: constant stirring of thought, constant holding of conventions and institutes; constant reading and study, that if possible, these men who keep cows and do not realize what dairying means, may be reached and lifted up until they can see the question in its true light.

Think of the great width of this question. Think of the vast army of men it supports from the farm to the creamery and cheese factory; to the thousands of dealers and commission merchants; to the manufacturers of machinery and dairy supplies; to the great transportation interests on both sea and land that look to it for sustenance. Then think of the millions of consumers who wait upon the cow and all these intermediaries for their daily food. The cow makes it right, pure and good. If there is any thing wrong with it, it comes from the ignorance, indifference and willful neglect of the men who stand between the cow and the consumer. Chief among these is the farmer. He must be held to the largest responsibility for he has the most to do with the milk at the time of its greatest liability to bad impressions. At every stage beyond him modern science has done more to perfect the way than it has at the farm, and this for the reason that farmers, as a class, have not believed in science. They have not taken an educated mental interest in their business. The domain of science is in the mind and farmers have had but little mind for it. Hence, they do not see how it bears upon their work. The greatest problem in

agriculture today is to get the farmer to see where science touches him and his life work and so take advantage of what she has to give.

Right here lies the larger meaning of dairy farming. I have spoken thus in a general sense so we may take a larger view for a moment of the great field dairying occupies and the necessity that exists that the dairy farmer should comprehend well his own relation to it. I have selected a few special lines to talk upon that bear most sharply upon the farmer. First of these is the breeding of the right kind of a cow for his work. Do you know that when we come to study into this question, it is absolutely appalling to see what enormous losses the farmers of the country sustain because they will persist in breeding and keeping cows unfit for dairy work.

Hoard's Dairyman has spent \$3,000 in taking cow censuses in ten states, from Iowa and Minnesota all the way to New England. In several of these states such as Wisconsin, Ohio and New York, several censuses have been taken. In the main they were of 100 herds each. As accurate study as possible was made of each cow, in each herd, and a statement made of what she earned at the creamery and what she cost in feed.

From this mass of testimony, the best that has ever been attempted, we find that fully one-third of the cows are kept at actual loss.

Think what a drain upon the farmer and the country this is. Is it not time that the men who keep cows tried to obtain a better understanding of what it means to be a dairy farmer?

The Upward Step.

We are all affected by our environment. How universally true is the old saying "A man is known by the company he keeps." There is no getting away from the influence of association. Every farmer is subject to it. The books and papers he reads are his associates, just as much as the men he meets. One of the greatest dairymen Wisconsin ever produced was Hiram Smith, of Sheboygan county, who died in 1890 and for whom one of the important buildings on the University Campus, the Hiram Smith Hall, was named. One of his favorite sayings was, "A registered sire is a great educator. It is an upward step." He had seen farmers about him in all stages of development and with no development and he declared that there was no hope of a man's upward progress as a farmer just as long as he kept a grade or scrub sire. Here again do we see the effect of the law of association. We have noted it ourself in hundreds of instances. All about us in Jefferson county, Wisconsin, now noted for its production of dairy cattle, are farmers who have made handsome progress in knowledge and wealth. Their progress dates from the very hour that they commenced keeping a pure-bred sire. A large proportion of them are Germans, who have been obliged to learn to read English in a slow and difficult man-

ner. They saw the improvement that came in their neighbor's cattle from such a sire. That set them to thinking. Buyers came and paid more for the helpers and cows from such sires. The buyers were a different order of men. They talked on an upward grade. Here was another association. One good sire at registered prices succeeded another. That was more association. Their minds began to expand; they could see more in this business of dairy farming. Their farms are selling for \$100 to \$150 an acre. They sell annually a half million dollars' worth of cattle. Their sons are going ahead, making more intelligent dairy farmers than did the fathers. They are attending the short course at the College of Agriculture. Several of them have branched out into breeding registered cattle. In 20 years there will be hundreds of such breeders in Jefferson county. Who can measure the influence and effect upon a farmer when he commences to associate with pure-bred cattle?

Yes, Hiram Smith was right. "A registered sire is a great educator." Verily, "A man is known by the company he keeps." Scrub cattle will hold a man down to scrub ideas on general farming. There can be no "upward step." The influence is retroactive on both the farmer and his cattle. Better ideas lie at the bottom of all betterment.

There are a hundred copies of dairy and agricultural papers read by our Jefferson county farmers today where there was one 20 years ago. The barns, the fences, the fields of alfalfa, clover and corn, all show an upward trend in thought as well as in the methods they practice. How powerful has been the reflex effect of this law of association. Let us be careful of the company we keep. "Birds of a feather flock together." When a man buys a registered sire he gives notice to the world that he is on an upward grade himself in his ideas of cattle. It will not be long before he will think towards improvement in other things.

Keep the Calves Dry and Clean.

Every human mother, that is fit to be a mother, knows that if her baby is allowed to remain wet and uncleanly, it will soon grow sickly. The bovine baby is strictly amenable to the same law. Every calf raiser must have seen the ill effects of allowing calves to lie in their own voidings and urine. A farmer was once showing us his stock. His horses were bedded down with an abundance of straw. His calves were lying in filth and moisture that made us indignant to behold. "What are you raising those calves for?" we asked. "To make cows of them," he replied. "Oh, no, you are not. You are raising them to be weak sickly failures," was our answer. He confessed to us that he had lost a good man's calves, but he never had thought that the way he kept them was the cause.

Turn a calf or a pig out in the woods and it will find for itself a bed of dry leaves in a clean place, and they will keep healthy, if they have food enough.

In my own calf stable every winter are from 25 to 30 calves. Around the outside, next to the wall, is a feeding alley. Then comes a row of stanchions, the only place on the premises where I use a stanchion. Then comes the open ample room with a dirt floor. This is covered every day, and if necessary, twice a day, either with bright dry straw or shavings. This floor is sprinkled night and morning with a good disinfectant. The calves are fed in these stanch-

ions, with skim milk, fresh from the separator, in clean tin pails twice a day. Then they are given a feed of oats or barley meal, followed by alfalfa hay. All this consumes an hour, say. Then they are let out of the stanchions to run at will on the floor. Twice a day they are let out in the big barn yard to have a run and play. Fresh water is kept standing before them, on the floor of the stable, all the time.

Now this care takes a little time and thought. But you can never have skill and good judgment, nor the rewards of skill and judgment, unless you invest time and thought. All this care has a great effect on the future cow. I have raised but one heifer, pure bred or grade, to cowhood in 15 years, that would not produce 300 pounds of butter and over a year. It is this careful developing, care and feed. I believe, aided by good breeding, that has given me these results.

Don't you think I have made a good deal more money with my cows by this method, than I would if I had pursued the common neglectful way? Farmers have not yet begun to half think, on the fine possibilities there are in the production of valuable cows. The demand for dairy products, all over the Union, is far ahead of the supply. And the cleaner, sweeter, more perfect we make that product the more does the demand increase.

Think of the demand there is, today, for good cows. A few weeks ago Mr. F. B. Fargo, of Lake Mills, Wis., placed a five-line ad. in Hoard's Dairyman, offering to furnish Holstein grade cows by the car load. In two weeks' time he had received hundreds of letters, as far distant as Texas, Mexico, California, Oregon and the States on the Atlantic coast, the writers of which were all anxious for one or more car loads. He was amazed at the demand. It is so in other dairy breeds. Don't you think it will pay to turn your attention to the question of producing superior cows for your own use and the market?

The present methods of handling cows, in the great milk producing centers, amounts to the destruction almost of all calf raising. Cows are bought, fed high for a year or so, and sold to the butcher. This makes all the better, the chance for the intelligent, far sighted, dairy farmer to make a handsome profit in growing cows to supply that market.

A Good Bull.

There is a great host of dairy farmers who cannot yet see the cash advantage of buying a pure-bred bull and paying the going price for him. The price blinds their eyes, and so they go around looking for a cheap bull, not one that can bring them something good in return. They will say, "Oh, I'm not breeding registered stock. I cannot afford to pay the regular price for a bull." That is short sighted economy as sure as they live. They are keeping down the quality of their own cows in the future and the value of the young helpers they may want to sell. An Illinois man who annually buys over a hundred thousand dollars' worth of cows and helpers in Jefferson county, Wis., said to me recently, "I buy a cow on her looks, but I never buy a heifer until I take a look at her sire. If he is a good one, I am more confident of the value of the heifer."

Now, here is a practical example drawn from my own experience: In February, 1902, the Guernsey bull, Starlight's Excelsior 7992,

was born. He was bred by the late N. P. Fairbanks, of Lake Geneva, Wis. I bought him when little more than a calf, paying a price up in the hundreds for him. I was attracted to him by the rich character of his pedigree, the excellent record of the cows back of him and his strong prepotent appearance. He will be five years old February next, and is in his prime. From that bull I have sold \$810 worth of grade Guernsey heifer calves, \$1,500 worth of registered heifer calves, \$2,000 worth of registered bull calves, making a total of cash sales of calves, from him, of \$4,310. I have on hand six of his heifers in milk two years old that I can sell any day for \$1,500, and 18 of his calves with nine more to come that are worth at a low estimate \$2,500. This makes the total value of his stock up to date, \$8,310. Cut it in two, giving one-half of the value to the cows and then the bull stands credited with \$4,155. Could I afford to pay a good price for him?

When I was a boy I read in an old almanac this verse:

"A fiddler had a cow and he had nothing for to feed her,
So he took his fiddle and played the tune
'Consider, cow! consider.'"

Allow me for a few minutes to ring the changes on the word "consider." Please consider that the grade heifer calves of this bull, such as any farmer can raise if he will but have rich blood in the bull to start with, brought me \$810, double what he cost me. It is hard to make dairy farmers see that they want good well-bred stock themselves; next, that there are thousands of other farmers that want it more than they do and are willing to pay for it. Consider, that there is no one form of our live stock today that is so scarce as good cows: that in the natural evolution of public conviction, cows will be scarcer owing to weeding out of unfit cows and consequent reduction of the size of the herds; that the consumption of milk as a food is increasing to an enormous extent and as a consequence is stiffening had no such ideas? He lives on a rented farm of 171 acres and he gives cash receipts of the farm in butter, cream, hogs, poultry, young cattle, etc., to the amount of \$4,000 annually and he has half of it. Don't you think it pays him to practice advanced ideas of farming?

The Matter of Breed.

It is a common thing to hear men say: "Pay no attention to the matter of breed in cows. What you want is a cow that will do business at the pail." That sort of talk is very superficial. The question of breed is a very important one. The farmers of Minnesota followed Prof. Shaw for years and as he told them, selected beef bred bulls to breed "dual purpose" cows for dairy work. They found at last, to their sorrow, that they were getting the losing end of the bargain. Their cows were failures as dairy animals. Hoard's Dairyman warned them against the practice, and anybody who had an understanding of the effects of breed on feed, could have told them the same. For years the farmers of Iowa have been advised the same thing. All the forces of agricultural education were put in requisition to hold them to the "dual purpose" idea. But the cows resulting from such breeding are not, as a rule, economic dairy animals. The Iowa farmers, those of them who are looking into the thing, are finding that with

such cows, they are losing more at the pail than they are making in beef. And so they are getting around. Hoard's Dairyman has for years preached this doctrine: If you want milk you must breed for it, and breed for it specifically.

Mistakes in breeding are a long time in making themselves felt. Hence the importance to every farmer that he should have in the prices of butter and cheese. In most of the butter and cheese producing districts there is a noticeable lessening of production owing to the drainage of cows away to other sections for city milk production.

Consider, that in all these city milk producing districts there are but very few calves raised, while the cows are kept rarely more than three years.

Consider, that only one-half of all the calves are heifers and of these but a small percentage reach cowhood, that consequently the increase of cows in so great a dairy state as Wisconsin has been only 5% per cent yearly from 1850 to 1900. Consider, that every child born is a consumer of milk but not always of meat.

Consider, the enormous increase in the population of this country, vastly ahead of the increase in the cow population. Consider, all these things as having a bearing on the future of the dairy industry and then tell me if you do not think there is a good prospect ahead for the farmer who will go into the business of producing and rearing first class dairy cows, bred from sires of undoubted dairy parentage.

I have a neighbor, a bright keen German dairy farmer. He buys, every four or five years, the best registered Guernsey bull calf he can find to replace his old bull in a year or so. He pays handsome prices for his bulls and he will not buy a cheap animal. Mind you his herd is nearly all grade cows. He is a fine calf raiser and sells annually from 8 to 10 prime young heifers and yearlings for from \$25 to \$40 each, and he has quick sale for all he can produce. He will tell you every time that the great factor of success with him is the high quality of the bull he keeps. Don't you think his advanced ideas pay him better than as though correct ideas as to the principles of breeding. No wonder that he is confused when well-known teachers and breeders juggle with these principles. It is as though one said, "Twice two is either three or five just as you want it." Yes, there is a great deal in breed. We once heard a story of a "dual purpose" man who went to hire out as a teacher of a country district school. The clerk asked him a few questions among which was this: "Is the earth round or flat?" "Well," said the man, "I teaches em both ways, just as they want."

A great many farmers have wanted "dual purpose" cows if they could get them. They called for that kind of teaching and they got it. But it was wrong, and they are finding it out in the last analysis of real practical results, at the pail. The farmers who staid by the dairy bred cow are winning by it. Yes! there is a good deal in breed.

I spoke of the effect of breed on feed. There is a great mystery here, that no man has solved. Here stands a bale of hay. On one side is a cow; on the other is a sheep. On the other a horse. In one case the result is milk, in the other wool, in the other speed or draft, and the same mystery appears in the same family of animals. Twelve quarts of oats fed to J. I. C. resulted in a mile in 2:10. That was the speed product of 12 quarts of oats, provided they were

fed to J. I. C. Two cows stand side by side in my barn. They are of the same breed, and both are fed the same ration. One cow takes that food and turns out two pounds of butter fat a day, the other one pound. What is that secret through which comes such a wide disparity of results? So far as we can see, it is individuality.

Now, men have seized upon these individual traits in animals. They are functional in character. By steadfast, patient work, mating agreeing individualities or functions together, after a long time they have established these traits as breed characteristics and we have the speed or draft function in horses, the milk and butter trait, or the meat producing trait in cattle, the fine wool or mutton function in sheep, and so on. A great variety of ruling traits have been established. But it is very slow work. Nature yields but reluctantly to any and all modifications of structure and specific purpose.

The modern dairy cow, as has been well said, is an artificial product. She is greatly needed in the sharp, close economy of our farming work because of the greatly increasing demand for her product. This modern dairy cow is not a rustler. She must be given the care, surroundings or environment, and feed suitable to her artificial nature, if you expect the results she is capable of giving.

Then comes this everlasting proposition of farm economics, reducing the cost of production. When I turn to those two cows, one giving me twice the product for the same cost of food that the other does, I naturally enquire how this comes. Now when veloping care and feed, I believe, aided by I find that the first cow comes down from a better line of producing ancestors than the other, it is apt to impress me with the idea that there is something in breeding, not everything, but something.

Now, all there is to this question of breeding for specific qualities or traits, is the at-

tempt to establish as a breed characteristic, that which originally existed as an individual characteristic. So after a long time, we have the Holstein cow with her peculiar traits, bred into her for a thousand years; the Ayrshire with hers, the Jersey and the Guernsey with theirs. If you study her you will find that Nature does her best work in straight lines, and in obedience to single purposes. If you attempt to make her construct a combined speed and draft horse, or a combined milk and beef cow, she tells you at once that the structural type or form of each is different, owing to the demand of differing functions, the same as the difference in form of the sewing machine and the mowing machine.

She tells you also that established prepotencies of heredity, one opposing the other, cannot be mated and combined to the establishment of a third prepotency partaking of the nature of both.

She tells you further, that such a forced combination results in a conflict of prepotencies and no wise breeder will set Nature to fighting herself. Our "dual purpose" friends have made one serious mistake. They have based their theory too much on the sporadic or occasional appearance of some most excellent cow here and there in their ranks. They have gone on building the beefiest bulls they could produce, paying no attention to the laws of dairy form and function, and expecting profitable milk results from such a contradictory combination.

I have asked for years this question: "Where are the Shorthorn bulls, for instance, that show in their form and outline, a milk heredity, or that can be depended on to breed with any profitable certainty for milk production? This ignoring almost altogether the male line of descent, all the time breeding from the beefiest of beef heredity, and then talking about "a milking strain" is unscientific, impracticable, and as the old Yankee said, "insensible."

SPECIAL DAIRY SESSION

Discussion Led by Mr. P. C. Holme of Baltimore

The question with us has been to get a good standard brand of prints. We sell at two to three cents higher than ordinary, and we pay two cents more to our nearby creameries. * * * I am sorry that two creameries from Pennsylvania which have been furnishing us with half-pound prints, have been turned down because of the continued poor quality, and we are putting in a line of prints from Minnesota. Now when I think that it is only about thirty miles from the creamery here, and on the other hand, we can get only one shipment from Minnesota per week, and it takes six or eight days to come through, be put up in one-half pound prints and then we sell it as fine standard grade, it shows that there must be a difference between the Minnesota butter, and that from Pennsylvania. Now why is it? We have just as good pasture land in Pennsylvania and as fine soil as anywhere in the West. There must be some reason for it. I am firmly convinced that the reason is of the greater interest taken in that State in the dairy business and the amount of appropriation and efficiency of their dairy schools, and the efficiency of their State Inspection. Look as an illustration at the two butters, and re-

member that one is of the selection from four nearby creameries and the other is a selection of three of the western creameries. I said to one of the salesmen only yesterday, "Are you having trouble with the one-half pound prints?" He said, "We are putting out the butter from the West and are having no trouble at all."

Now, of course, the great trouble with the eastern creamery is the acceptance of poor milk. We can tell you without ever being informed or without the number of shipments, when farmers deliver the milk each day or every other day to the creamery. We do not have to be told. There is a taint about the butter, which develops more and more, and I think that that could be corrected to a large extent if we had more intelligent butter makers. I do not mean to cast any reflection upon any of you. As I said, I do not know anything about a large number of creameries. I know this,—that in twelve years we have been making selections we have tried a large number of creameries in Maryland, and I am sorry to have to say that we have not selected one that meets our demands, and I do not believe that we are over crit-

ical. We have invaded Pennsylvania and as a result of trial we have retained two from twelve. During certain times of the year we cannot handle their product, and I am certain that it is largely due to their acceptance of stale milk or milk that has been handled in cans that are not clean, and lack of knowledge on the part of butter makers. I see no rule except the establishment of first class dairy schools and a number of inspectors. As Prof. Van Norman told you, we are to call upon him for assistance. What we want is an expert buttermaker to go to creameries at our expense and spend several months at each creamery in close contact, and give them practical instruction in buttermaking. At this time the State could not furnish a man, but in Minnesota they would send an inspector, at their own expense, and if there were any difficulties in the creamery they would be cured, and that would also be the case in several other States in the west, and yet there is not sufficient appropriation in this State to pay the expense and furnish an expert. * * * I am not in the habit of speaking at conventions of this kind. I was invited simply to talk a few minutes, and I do not know that I have anything further to add. I am prepared to answer any questions that anybody may want to ask. That is, I am not prepared to give the solution, but if I can answer them, understand me, I shall do so.

Mr. Pearson of Berks County.—Are the Elgin creameries buying milk or are they buying cream that has been separated?

Mr. Holme.—My impression is that a large number of them are buying milk, or at least so far as my knowledge goes the creameries that are getting the milk and separating it themselves are doing the best work. I believe that it is altogether possible for the creameries to be run upon other conditions, but I think the tendency is to exaggerate the trouble already spoken of with the acceptance of stale milk or cream rather than to remedy it. You can see that if a man separates cream at home and has a few gallons of cream, he waits until he gets more, and is certainly much more likely to extend the time of taking the cream to the creamery than to lessen it, and judging from what I have seen of the western butter people, and looking at it from one source, of the few that keep creameries and accept the cream, they do not uniformly make as good butter as those that accept milk.

Mr. North.—In what way do the demands of your customers differ from other markets? I understand that most markets have an entirely different style.

Mr. Holme.—We should say that our market differs from the average market in demanding a higher color, in demanding more salt and in demanding and as a rule accepting a little less working. I should pay that we accept butter less worked than Philadelphia market, not so dry and more salt. However, what we want is a good, clean flavored butter.

Mr. Sharpe.—May I ask a question? Does your dry-worked butter keep better than butter not worked so dry,—when in storage I mean?

Mr. Holme.—We have not had much experience with dry-worked butter. I have think that I can say of butter from the West, but not until this winter, it came

out in good condition, but I am not able to say that it is better than other butter not so dry.

Further than this, the man who works his butter more is more apt to injure the keeping quality. However, to salt butter over and over again would apparently add considerable moisture to it. You know that question of moisture, however, is something more apparent than real. We sometimes have considerable complaint of persons thinking butter wonderfully salty when it is not.

Question.—Is the keeping quality of butter influenced by the washing or the butter milk in it?

Mr. Holme.—I do not know that I am qualified to say, but I should say not. I should say that the keeping quality of butter was dependent first upon the quality of the milk. This I know was the experience of one of our butter makers who ran a creamery himself, and had some rejected cream sent back immediately. This was in perfect condition, and they tell me he used to churn it up with the rest of the cream, and for the first two or three days they would not notice any difference, but suddenly the butter would become shorter, and they attributed it to the taint from that small amount of cream, and they stopped that butter was very much improved. I think that the poor keeping quality is due to the practice and the keeping quality of cream or milk that is not in the right condition, although I do not know very much on this particular point.

Prof. Van Norman.—I wish this question would come up later when the government expert will be here, and he can doubtless give us some information on that point from the Government's experience in cold storage work.

M. Knuppenberg of Wyoming County.—I would like to hear something concerning the milk can, whether it is better for patrons to take care of the cans or to have them taken care of at the creamery? What is the practice of the gentlemen here?

Mr. Henry.—I have never had experience to speak of. I know that in New York the creameries are doing it for themselves, and not allowing patrons to take home skim milk in cans.

Prof. Van Norman:—

At State College we are running a commercial creamery, and we are up against the same proposition, and at present are allowing them to take home the skim milk in the delivery cans, and making butter that would be a little above "extras." We are not making the best butter that can be made, for the reason that many of our patrons are farmers, who keep small herds, and you cannot get as good milk from men who keep from five to eight cows as you can from men with twenty cows or more. We are trying to work the business up to a still higher standard. Some of our western creameries are requiring all skim milk to be pasteurized, and that it is returned hot, and that acts as a sterilizer of the cans. If emptied promptly and washed that should give satisfaction. I would like to know the experience of the creamerymen here.

Mr. Cornell of Troy.—I am much interested in all these talks, but I believe that the creamerymen must meet the conditions as they are, and not as they would like to have them. With reference to the talk of

receiving whole milk, I am satisfied that the gentleman from Baltimore, who addressed us in this regard is right,—that the better butter is made, as he suggests, but we have the hand separator with us and it is here to stay. We must meet the conditions. It is a problem that can be worked out. We receive whole milk and cream. Now I advocate the hand separator. I believe that it is the only way for the farmers to produce milk and patronize the creameries, and when enough have them that you can put a team on the road and gather that cream we have the whole proposition within our control. You can go to that farmer every day and get the cream direct from the farm, and that would be the best condition, and no skim milk back in the cans. If we could come to the condition where we could collect this cream every day, we could go in hot weather every day, this would be the proposition that I would like to set at in our section. Since the hand separators are there and there to stay I would like to put a hand separator into the hands of each of our patrons, and this would save what it would cost to run our separators, then we could put the team on the road, and if we had any complaints from the market we could trace it right back, and if the butter is not right, we could see just where we collected the poor cream. Now this is my view, and I would like to hear from others,—what their experience is with the hand separator?

Mr. Pearson.—I have no business to talk here, because I am not connected with it, but I am a buttermaker and farmer. I have a separator, not a hand separator, but a farm separator, and I make butter and sell it to customers in the city of Reading, and it has always seemed to me theoretically at least, we should be able to make the best butter, better than the creamery milk is separated right from the cows as that collects cream once a day, because our good as you can get it, but it seems to me that the separator rids us of all bacteria or at least a large portion of it before they have a chance to increase in a great degree. At a small place like mine the trouble is not in caring for the cream, but it seems to me that the care required for the cream is much less than that required for the milk. It is probably something I should not tell. We churn only once per week. The larger creameries say this is not good, but I know that my customers say it is good, and they like it better than the best creamery butter that I can buy at the grocery stores as a substitute when I do not have enough of my own to handle.

Mr. Watson.—Let me ask the gentleman who spoke of hand separators, how often they collect the cream or how long it stays at the farm before it is required of them to bring to the creamery? This is the question I would like to find out. We have trouble to get our farmers to bring it often enough.

Mr. Cornell.—We are placed in the same position in the milk and cream question that has been described. We are at the mercy of the farmer, because there is not enough to make it practical for us to go after it. We have had the same conditions as described. When it gets cooler they come three times a week, as the case may be. It is so with the hand separated cream. They bring it when they feel disposed, and we have to take it, of course, because we

know that if we don't the other fellow will, but in hot weather we insist in so far as we can that they bring it three times a week. At present they come twice a week, but occasionally a man meets with bad roads, and then only brings it once a week. I am trying to work with the farmers and get them to put in hand separators, so that we can go to each of the houses and feel independent.

Mr. Perham.—In regard to the hand separator business I want to say just one word. Now at our creamery (at Niagara, Pa.) this summer we had ninety patrons, and sixty out of the ninety brought cream from hand separators, but during the hot weather we made them come each day, the same as with milk. Now for one lot where the farmers live two to four miles apart, we had sixteen in that lot. We furnished them with a wagon and they took turns going for the cream. That is, once in sixteen days, each farmer had to go for the cream, so that it did not fall but twice a month for each one, and we made them come every day until cold weather, although with three or four who had very cold spring water we allowed them to come every other day, but unless they had that, every day, and we did not have any trouble along that line by so doing.

Major Wells.—I did not hear all the remarks, but came in about the time of the asking of the question, but the question I have to ask is derived from a conversation with a Minnesota man. We were discussing the difficulty of poor quality of cream and infrequent delivery of it, and in washing separators, and all things connected with it, and I asked him why such conditions prevailed. He said, "there is positively no inducement to improve." Well now, that coming from an official seemed strange until he explained it, and said that they do not get any more of those creameries that manufacture first class butter than they would get for the poor class, and I thought perhaps this gentleman might set us right in this subject. He says that butter in the West, at least the bulk of it, is contracted for by the New York commission dealers, and the price is uniform, and what they lose on poor butter they make up on the good, and so make out their profit in that way, and careless people get as much as those that are particular, and I would like to know what inducement the dealers or commission merchants offer to improvement. It is putting a new phase on the subject.

Mr. Holme.—I am not in the commission business, we are rather butter dealers. We handle seven or eight thousand pounds per week. I believe there is truth in what you say but not all truth. We have one large shipper in the West who has several creameries. During the last part of the year, when we handle the most, his butter was superior to others, and we wrote to them telling them that we could give them one-half cent more than we were giving the others, in order to get it from the creamery, and then there is another point about it. I think it is largely true within certain bounds, that is where there is first class butter and that which is a little inferior, I think they will sell, perhaps, for the same price at the two creameries, but if it is a good brand, it will always find a market, and if some competitor finds that it is of good quality he will offer them a slight advance. That has been our experience, and

I have found that when a commission man gets a butter that is strictly first class, he will offer one-half cent more for it. At the same time, on the other hand, the man who makes the better butter will always find a market, and he will have no trouble in getting rid of a surplus, while the other man may have a different experience. It is safe to say that you will make out best with the best article you can get, but nevertheless it is a difficult thing to convince them that anything is the matter with their butter because they are accustomed to the taste.

Major Wells.—I went back on the market with butter one summer, with one hundred pounds per day, and could not find a market to suit me. It went on the market at fifteen cents per pound, and that was followed up, and in but a comparatively short time we were getting for the same one-half cent per pound more for that butter and the commission house wrote to me asking why it was that our butter stood up better, and gradually the quality of that butter made a place for itself, and my experience would convince me that any creamery man who is putting out a first class article on the market will find that it makes a place for itself, and he will soon get the returns that the ordinary commission makes for good butter, paying an extra price over the poor. My experience would tend to show that you can absolutely rely upon good butter making a place for itself.

Mr. Cornell.—In regard to the commission man I do not think that we butter makers here in the East have any right to depend upon the commission man for marketing our products, as they are supplied largely from the West. But from the standpoint of those persons,—are not the commission houses up against the same thing as we? Why do we not make a difference between the milk that comes to our creameries? The commission merchants have exactly the same thing to face. Hence they do not always make returns according to quality, but we should have a limit for our own goods in this regard, and we should have our own market and cater to it. If we are to market in Philadelphia we should certainly study that. If we have a certain dealer we should study his wants and needs. I can see the commission merchant's position just as clearly as I see our own, and it is the very question to meet.

Mr. Smarzo.—I want to say that if the creameryman sends in good butter, he will get more than some other for first class butter, but if seconds or thirds, he may find a market today for the seconds and thirds for the reason that butter is scarce and the commission man needs it and the people need it, and he is benefited by two cents on all, and the same way with thirds, but the man with extras gets a very high price. It is the lower grades that vary.

Prof. VanNorman.—I want to emphasize this point. I saw four hundred tubs of butter scored at St. Louis three of the four months, it was sent to the Exposition. I have been in the New York market, and this I am prepared to say, that first class butter is first class in all the big markets. There are commission men who are not good judges of butter, but they have built up a line of trade and have the kind of butter to meet the trade, but they will all agree on it that good butter on the market it is good butter wherever you go.

Mr. Smarzo.—I came here to score the

butter. I did not come to make a speech, I am not a specialist in speech-making and could not make a speech, but I notice that your talk is mostly on quality and that it is universal over the United States more than ever before. I know this is the case and it is not a talk on the markets which I wish to make. Now whose is the fault in this quality question? A few years ago we did not have so much quality talk because the butter was of better quality. What has brought about this condition? I speak of the New York market because I am most familiar with it, and not so familiar with the other markets, yet I hear many complaints. I am going to speak from the standpoint of the Iowa butterman, as I see very little of the product of the Pennsylvania man,—only what I saw this morning. Now at the start in Iowa and Minnesota it was the hand separator question which brought about the low grade of butter. The trouble was in the start. The hand separator man went about and said, "We want to sell you a hand separator, and you will get just as good results, and you do not have to cart the milk to the creamery," and then the man would say, "must I wash this separator every day?" And he would answer, "No, only every other day." Right here at the start I want to say that the man who is making butter and who does not wash his separator regularly and carefully had better get out of the business, because he is filthy. Yes, filthy, I say, and he should be put out of the business. Unless you furnish the buttermaker with first class cream he can not make first class butter. An inspector from Iowa when asked what the trouble was there said that a good many of the farmers were not washing their machines every time they used them, and the man asking the question said, "You mean to tell me that every time my hand separator is used I have to wash it?" He was told that was the thing to do. No one should be in the dairy business who does not wash the hand separator properly.

(Concerning the butter scoring Mr. Smarzo spoke in part as follows:)

I find nearly all the butter scored, showing poor workmanship. In fact, I have picked out only two pieces which show fine workmanship. I understand that there are three or four creameries in this State, shipping butter, who represented the complaints about the quality of the butter, and the buyer had to go to Minnesota, and pay more money for it to get what he needed. Now, I think it is a disgrace to have to go away and get butter, when you can make just as good butter right here in Pennsylvania, if you will only get into line and study the conditions well.

Prof. Van Norman.—How many here today sell butter to commission men? (No hands.)

Mr. Detweiler.—Is there any advantage in pasteurizing sweet cream?

Answer.—You mean cream gathered on the farm. We say that it is just temporary, after five or six days it is just as bad as before. Some persons think it is all right, but I do not think it is satisfactory.

Prof. Van Norman.—Our best western creameries pasteurize their cream.

Mr. Cornell.—Are those creamerymen who pasteurize receiving cream every day or how often a week?

Answer.—Every other day, and I do not

think that creameries should receive cream more than two days old.

Mr. Cornell.—However, if you do not receive it, do you think it will help it to be pasteurized?

Answer.—I cannot answer that just now. Mr. Hellman.—Is the acid test practical for the farm butter maker?

Answer.—Yes, I think so, a very simple test.

Prof. Van Norman.—I would say it is a question as to whether you have the time to bother with it. If you are making five cents' worth of butter you certainly can't afford to take ten cents' worth of time to test. The small butter maker cannot afford to do it.

Mr. Neidig.—I should like to know what commercial starter to use?

Answer.—Any commercial starter is all right or will bring about the same results, only some develop faster than others, but you can get accustomed to any of them, and you will get good results, but I would urge upon you the importance of standing by any starter that you start with. Do not jump from one of these to another. Some work very rapidly. You may set one at eleven o'clock, and others would be ready until morning. However, as I said, you get accustomed to the time and nature of different starters.

Mr. Leonard.—Is it necessary for the farm dairyman to use a commercial starter?

Answer.—I would not advise him to go to the trouble, unless he makes quite a little butter and has trouble with the conditions not being perfectly clean. I do not think it necessary.

Question.—I would like to hear that question in butter discussed in regard to the keeping quality.

Prof. Van Norman.—In regard to the influence of water in butter, you mean?

Member.—Yes.

Prof. Van Norman.—I was in Washington the other day and Mr. Webster told me that they are experimenting in that line. Butter containing over sixteen per cent water is considered adulterated, and some are taking advantage of that and are approaching the limit as nearly as possible. Now we find that ordinarily in making butter you will not exceed fourteen or fourteen and one-half per cent of moisture.

Mr. Reeder.—What is the right temperature?

Answer.—That depends upon the percent of fat in the cream. If a lower percent of fat, the higher temperature.

You cannot have a fixed temperature at which cream should be churned.

Question by member.—How about sixty or sixty-two?

Answer.—I would not go as high as that.

Question by member.—At what temperature do you churn?

Prof. Van Norman.—We churn at about fifty-four in our factory work.

Mr. Hartley of Warren.—What difference should there be in the temperature between the time of putting the cream into the churn and the temperature of buttermilk after churning is over?

Answer.—Not more than one or two degrees. That would depend upon the temperature of the room.

Remark by questioner.—My reason for asking was that anyone could test buttermilk if he did not know much about making butter, but I have found that butter

came out nice in the granules if you put the cream in the churn about the same temperature.

Answer.—That may be true, and I am not familiar with dairying and dairy butter.

Prof. Van Norman.—Two degrees below that would be safe. I said that would be a safe temperature and would bring butter in about twenty to thirty minutes in good condition.

Mr. Smarzo.—I notice that a good deal of this butter here is salty and the washing has affected the texture of this. Use a thermometer, and get the right temperature for the rinse water.

Mr. Morgan.—Did I understand Mr. Smarzo to say that the best temperature at which to churn depends upon the test of percentage of butter fat in the cream?

Mr. Smarzo.—That is correct.

Member.—I have a farm dealing out milk from about twenty Guernseys at the rate of five percent. We had been churning at sixty degrees, and I have argued with the butter maker that he was churning at too high a temperature, but immediately after drawing the buttermilk he puts the butter in cold spring water and washes it as long as there is any color in the water, and we are making pretty good butter, but I see by your remarks here that we are going wrong.

Mr. Smarzo.—I am afraid that you are liable to make the butter brittle with that temperature. I would lower it down and have the butter to come in the form of granules, and watch the temperature of the water, and use it only about two degrees more. Wheat degree of water do you use?

Member who asked question.—I judge it is forty-five. It is pretty cold water.

Mr. Herman.—I would like to hear of butter milk in relation to keeping quality.

Mr. Smarzo.—It does injure the keeping quality of butter. It should not be present, and if churned at the right temperature you will have no trouble with it. There are people injuring butter by washing it too much, as the granules are not only injured by this washing, but when given two or three washings they wash out the delicate flavor and seriously injure the texture, really one good washing is all that is necessary. You should not have any buttermilk in your butter to work out if the temperature is all right and the other methods are followed out properly. * * * I know that my mother used to work out the buttermilk because her temperature was not right, but I can see now that she injured the butter in order to get out the buttermilk.

Mr. Pearson.—Suppose in stopping your churn you miss it by a trifle? That is, it seems to me it is almost impossible to stop the churn when it is in the exact condition for washing out the milk. Therefore, would it not be better ordinarily to make it a reason for washing out with two waters?

Answer.—There is the question of temperature again. If the temperature is all right you can meet this, but if the temperature is too high it requires two or three washings.

Remark. It would seem to me reasonable that two washings should not injure the butter to any great extent?

Answer by Mr. Smarzo.—But it is not necessary if the conditions are right.

Remark by Member.—I had a little experience the past year with a customer who

wanted dry butter, and I worked to get the buttermilk out and also the water, and I told him that I was sending it to him as dry as possible without injuring the butter, and he wrote to me, "You go ahead and work out the buttermilk until you get the moisture all out of it and I will be responsible." I did so and the butter was satisfactory, and he handled all that I could give him that season, but from my point of view it was over-worked. Now a little of that butter we put in storage and it has a poor flavor, which borders on the fishy taste from what our experience has been with others. Now what causes the fishy flavor in butter?

Answer.—We have not been able to determine but we find that fishy flavor in butter that has been overworked. Now a lot of people think it comes from salt, but I found it in two or three shipments of sweet butter, the same thing.

Remark.—A 1 butter that has been in storage and comes out with a salty taste will stand the pressure of the market better than butter that does not have it.

Remark by member.—That is because it has the right kind of acid. The acid gives it the good flavor and keeping quality.

Question by member.—I am wondering if some buttermilk was left in it how it would act?

Mr. Smarzo.—If there is any buttermilk in it, it is better to be taken out, and it is better to have the cream in good condition and the temperature will govern all that, so you will not have to work it out.

Member.—How often do you wash the butter at State College?

Prof. Van Norman.—I have two helpers here with me from State College and I will let them answer your question.

Mr. Knoll has been with me ever since I have been at State College, and Mr. Fortina can also give you some information.

Mr. Knoll.—We find usually that once is the condition that gives the best satisfaction, though if not sufficient we wash it twice. When the water runs off clear it is enough.

Mr. Fortina.—With our student work, generally twice, because the students (many of them) find it difficult to have the conditions right, and they are called to classes and in that way get different temperatures which will cause the butter to become salty or hold buttermilk at a high temperature, so we generally wash twice.

Question by member.—I would like to ask the buttermaker a question. He says it is enough when the wash water runs clear. Did he ever see the water run clear from the churn?

Mr. Knoll.—Yes sir, I have.

Prof. Van Norman.—That depends upon the churn.

Question by member.—In churning butter how large would you say the granules should be?

Prof. Van Norman.—I usually recommend that the churning be stopped when granules float well up in the buttermilk. The point is to get the buttermilk out, and as soon as it will drain out clear, stop. It is usually said that the butter granules should be the size of wheat kernels. All these questions hang together, and you can follow out the practice of any one question and get satisfaction. They dove-tail together. Temperature is a very important factor,—not only must you have it right to start, but you should also have it right a couple of

hours before churning. I should say about the size of a kernel of wheat is our standard size of the granules.

Mr. Herman.—What benefit is derived from cooling cream down to the churning point so long before churning?

Prof. Van Norman.—The liquid part responds more rapidly and that gives your temperature on the thermometer, yet the fat has not cooled as much.

Address by E. H. Webster.

I represent the Dairy Division of the Department at Washington, and I may have something to say to you this afternoon, but I wish to call your attention just now, while Mr. Smarzo is getting ready, to the nature of the work by the Dairy Division and what it is trying to do for you. Mr. Smarzo is personally representing that line of work, and it consists in placing at the disposal of and giving information that is of value to the dairymen. I know from the way you are asking questions of the difficulties of ascertaining what the trouble is with your butter. Now we have Mr. Smarzo at New York and Mr. Credicott at Chicago going about to the commission houses and communicating directly with the butter makers through the State authorities, showing what the trouble is with their butter that it is not up to the highest grade, and trying to ascertain in this manner what the methods are of the butter makers whose butter is not to the highest grade. In this way the work is strictly educational, and it shows the way for better prices, for purer grades and quality. I want to tell you of all this, because it will make you understand what we are doing at Washington along this line of work in which you are interested, and we are also trying to do the same things for other dairy interests, such as cheese making and dairying, butter making, or anything that puzzles you, you may feel free to write to the Dairy Division at Washington, and some one will be glad to afford you any assistance possible. We want to help along all lines of dairying, and especially along the line of actual profit in the dairy industry.

Prof. Van Norman.—The Dairy Union has a lot of expense in a meeting like this and we want a lot of members and dollars, and there are a great many persons in this State interested in this industry, and we want to push along this movement, and I am going to ask our Treasurer to pass around among you, and if any of you feel disposed or care to give him a dollar, he will be glad to take it and furnish you with a badge, and the Secretary will give you a receipt.

Prof. Van Norman.—The Dairy Union has been leaning on the Breeders' Association for a number of years back. Now, the question before us is shall we try to hold a separate meeting next year? The Breeders want to go to Pittsburg. Shall we go with them, or shall we come here or go to some eastern part of the State? Now I would like to hear this proposition discussed. I would also like to remind you of the fact that if we are going to get a display of dairy and creamery machinery, we have to hold our meetings where those people will come, and moreover we have got to do business with them, and I think it very important that we study their apparatus and make purchases in so far as possible from them. If we do this we can surely develop a creditable showing in this State. This State ranks second in

dairy products, and yet we have not had a dairy show for several years. I have been very much pleased with the start we have made. Now are there towns in this State that will do as much for us as the cities and towns in other States,—furnish a place to meet in, donate money. Now can we go where we can have all dairy or must we join forces with the live stock people?

Our dairy subjects represent a great many phases, and here we are trying to have one small session covering these various branches of the industry. We confined our meeting to the butter making problem, and we should take up many other problems. Now think of the many things of interest to many of us. I would like to see the Dairy Meeting cover at least two days and give all that time to these subjects that are productive of dairying, and I would like to hear the expression of what you think, what you would like to have and like to do.

Mr. Morgan.—I am new in the business, very new, but it would seem to me that we could hold a separate session at the same place as the Breeders' Association, and we would thus have the advantage in this way. There are some of us interested not only in dairying but also in the live stock and thus in the Breeders' Association, and we could lessen the expense of travel by holding the sessions jointly. That is, I mean on the same dates, although I think it might be better to have separate meetings. I was much interested in the programs of both sessions planned for this morning. Fortunately, the one thing I wanted to hear was Prof. Hayward who spoke last night, but my opinion would be the two meetings on separate dates.

Mr. Leonard.—I should be more in favor of having the Dairy Union and Breeders' Association meet in one town, for the very reason that it would save you one fare, and we could have the meetings two days apart. We would then have the privilege of attending both meetings. I think it would be well for us to do this as it would enable us to attend both meetings with one trip. But let us have it in the central part of the State. Some of us have to come a great way, and we could save travel if we could have it at some central point in this way.

Prof. Van Norman.—Pittsburg would be just as far to get to, and the Breeders are going there whatever we do. The question now is, shall we go with them or not?

Question.—Where is the bulk of the dairy interest, in the western or eastern part of the State. I would suggest holding it as nearly central in relation to the dairy interests as possible.

Answer.—The milk is shipped in the East and the butter and cheese making is in the North, all parts have some.

Remark. I thought that the central part of the dairy interests would be East of the center of the State. I am asking for information.

Prof. Van Norman.—That is pretty hard to state. The question is wherever we can have a good meeting.

Mr. Cornell.—I think I expressed myself in the presence of Prof. Van Norman briefly yesterday. If I am correctly informed our butter interest is largely represented along the northern counties, Tioga, Bradford and Susquehanna, and while for me a place like Williamsport is more central, yet I believe place in that section would be easily ac-

cessible from all points, and it also represents one of the greatest markets of the State right in that section, and I think it should be interesting from that point. Also the representatives from down below can get up into the section readily, and it would seem to me it would be very poor policy for the dairy interests to go to Pittsburg, and I should more favor moving little from Harrisburg, say toward Williamsport where the meeting has never been. I have considered this question, and I can get into that section next year, and I believe that it would be for the interest of the Dairy Union, and I do not think it policy to carry the meeting to Pittsburg.

Mr. Hartley of Warren County.—Warren and Crawford counties are in the Northwest corner of the State. This is in fact, quite a dairy corner. At one time we had the Pennsylvania Dairy Association of Crawford, Erie and Warren counties. We had it for years, and these people do not get to the East. I think considering all things, that it would be well to get in touch with those people up there, and therefore, I think it would be well to remain one year more with the Breeders, and perhaps in a year or two we may be able to walk alone.

Comments on the Butter Exhibit.

Mr. Smarzo.—All the butter exhibited came in prints or rolls. Now this is a mistake from the exhibitor's standpoint, for the reason that the print is exposed to the air and all unfavorable conditions around the same. If you would only put it up in stone jars, it will be much more satisfactory. As it is, it is not fit to score a print like that at all. You do not get good results, and I think if you will just kindly the next time pack your butter in five-pound jars or ten-pound jars, it will be well. People make a mistake in sending prints of that kind. I suppose it is the easiest way to send it.

Prof. Van Norman.—I would say that in Western associations they require twenty pounds in a tub, but knowing that most of our creameries here in the East were not used to it, we only required five pounds.

Mr. Notestine from Mifflin County.—I am interested in the dairy business, not in the creamery business, but in the retail milk business, and in the production and sale of it, and it seems to me that there should be an exhibition of milk too, and some way to analyze milk and tell us what it contains and the best way to handle it and all the other points in connection with the butter and creamery exhibits, and I think that our Dairy Union could be improved by it. Also I think that the Dairy Union could be strengthened by having local branches in Counties or County Associations,—say as branches of the Pennsylvania Dairy Union.

Prof. Van Norman.—I would call your attention to the second page of your program, and you will there find prizes offered for exhibits sent in, and I would say that although we have received very few, we are not faint-hearted and hope to improve along this line.

Your other suggestion is a good one, and I have this very thing down as one suggestion for my talk this afternoon,—the branch association and its relation to the State Association,—but I am glad to see your interest in the milk business.

No other business appearing we stand adjourned

LIST OF CREAMERIES IN PENNSYLVANIA

Adams Co.	
Bermuda	B. D. Hostetter
Cashtown	Cashtown Creamery Co., L. W. Swartz, Manager.
East Berlin	E. Berlin Creamery Assn.
East Berlin	J. D. Hershey
Gettysburg	Jerry J. Plank
Guernsey	John Geiger
Latimore	Latimore Creamery Co., Jos. Lerew, President
New Oxford	J. Diller & Co.
Allegheny Co.	
Wilkesburg	Bright View Dairy Co
Armstrong Co.	
Cochran's Mills	Cochran's Mills Creamery
Dayton	Dayton Co-op. Creamery Assn.
Top	King & Woodward
Whitesburg	Whitesburg Creamery Blaney & Son, Props.
York Springs	B. D. Hostetter
Beaver Co.	
Hookstown	Hookstown Creamery
Bedford Co.	
Rainsburg	George Morgart
Berks Co.	
Bally	Frank Janson
Bechtelsville	James Moyer & Bro.
Berne	Levi M. Miller
Bernville	Ahrens & Richardson
Bernville	Bernville Creamery Co.
Bethel	Ahrens & Richardson
Bowers	Bowers' Creamery Co.
Boyetown	Grimm's Mill Creamery
Boyetown	Boyetown Creamery
Calcium	Calcium Creamery
Calcium	Cleaver & Hoffman
Clayton	Clayton Butter & Cheese Co.
Crosskill Mills	Ahrens & Richardson
Douglasville	Charles Buckwalter
Eshback's	Hines Bros
Exeter Station	H. B. Levan & Co.
Fleetwood	Fleetwood Creamery
Fleetwood	Daniel Kelchner
Hancock	Hancock Creamery
Hamburg	N. A. Coufer
Huff's Church	Nathan Lehser
Kempton	M. L. Ritter
Kempton Station	Howard G. Kimmel
	Excel'r Dairymen's Assn.
Kilnsville	Kilnsville Creamery
Kutztown	Kutztown Creamery
Landis' Store	Joseph Boyer & Bro.
Lenhartsville	F. B. Levan
Lime Kiln	Oley Line Creamery
Little Oley	Fritzer's Creamery, J. P. Thomas, Prop'r.
Lyons Station	Jno. G. Harling
Manatawney	Pleasantville Creamery
Mertztown	F. Moyer & Co.
Mohrsville	Isaac S. Fraunfelder
Morgantown	Jacob Hartz
Morgantown	Morgantown Creamery
New Berlinville	Gilbertsville Creamery
New Berlinville	Congo Creamery
New Berlinville	W. H. Moyer
New Jerusalem	J. S. Henrich
North Heidelberg	Klapp & Kalback
North Heidelberg	Klopp's Creamery
Obold	Kalbach & Obold
Oley	Freidensburg Creamery
Oley	Hartman & Bros.
Reading	Franklin St. Creamery
Reading	St. Lawrence Creamery
Reading	Spang & Zacharias
Rehrrsburg	Ahrens & Richardson
Rehrrsburg	Ahrens & Richardson
Shartlesville	Ahrens & Richardson
Shoemakersville	Shoemakersville Cream.
Stonersville	Ahrens & Richardson
Straustown	Ahrens & Richardson
Topton	A. S. Heffner
Upper Bern	Levi M. Miller
West Leesport	Samuel H. Lenhart & Son
Windsor Castle	M. L. Ritter
Yellow House	Amos Hartman
Yellow House	Home Creamery
Blair Co.	
Tyrone	Hoffman Bros. Creamery
Henrietta	Elmer S. Berget
Bradford Co.	
Alba	Alba Butter Mfg. Co.
Allis Hollow	Allis Hollow Creamery Co.
Allis Hollow	Union Creamery Co. Ltd.
Austinvine	Austinvine Co-operative Creamery Co.
Brad	Wyalusing Creamery
Cadis	J. W. Prince
Camptown	Fuller & Blocker
Canton	Odee Creamery Co.
Canton	Glenside Creamery
Columbia Cross Roads	
	Austinvine Creamery Co.
Coryland	Coryland Creamery
Durell	Durell Creamery
East Canton	Silverdale Creamery Co.
East Smithfield	D. A. Stephen
East Troy	East Troy Butter Mfg. Co.
Grover	S. S. Vermilya
Le Raysville	W. B. Stevens
Milan	Pennsylvania Creamery Co.
Minnequa	James Ketcham
Myersburg	M. Butter & Cheese Co.
New Albany	New Albany Creamery Co.
North Orwell	George Pennell
North Orwell	Baker Brothers
Pottersville	Pottersville Creamery Co.
Pottersville	Orwell Creamery Co. Ltd.
Smithfield	Stevens Creamery
Sayre	Harkness Creamery
South Warren	Best & Wheaton
Stevensville	Stevensville Assn.
Troy	S. H. Heywood
Bucks Co.	
Argus	C. T. Hixon
Bedminster	Bedminster Creamery
Bedminster	J. F. Hulsheiser
Bedminster	J. F. Kilmer
Bedminster	Moyer & Hulsheiser
Blooming Glen	Blooming Glen Creamery
Blooming Glen	Pleasant Sprgs Creamery
Buckingham	Blooming Valley Creamery
Buckingham	Buckingham Valley Dairymen's Assn.
Bucksville	Kaiser & Kramer
Bursonville	Hixon & Mills
Carversville	Cary Betz
Carversville	C. Roberts
Chalfont	Chalfont Creamery
Chalfont	A. H. Faust & Co.
Church Hill	Church Hill Creamery
Church Hill	Jos. Guldin
Cressman	Milton H. Hickie
Danborough	Ottsville Creamery
Doylestown	Cold Spring Dairy Co
Dublin	Dairymen's Assn.
Erwinna	George Scott
Forest Grove	Forest Grove Creamery
Gardenville	Gotwals & Son
Geryville	Krausdale Creamery
Jamison	Warwick Township Creamery
Keller's Church	Wilson S. Atherholt
Levin	Frank Heterick
Makefield	Makefield Creamery
Milford Square	Henry G. George
Milford Square	A. H. Moyer
Neshaminy	W. W. Carr
Nockamixon	F. M. Moyer Via Ferndale
Nockamixon	Nockamixon Creamery

Ottsville	Aaron Leatherman
Passer	J. H. Shelly
Perkasie	Henry O. Moyer
Pipersville	A. M. Gerhart
Pleasant Valley	Dimlin & Gerhart
Pleasant Valley	J. H. Shelly
Plumsteadville	Plumsteadville Cream. Assn.
Quakertown	C. T. Hixon
Richlandtown	Keller's Church Creamery
Quakertown	William S. Taylor
Richlandville Centre	Landis & Moyer
Richlandtown	Richlandtown Creamery
Shelly	Henry B. Weiss
Solebury	Solebury Dairy Assn
Spinnerstown	Dairymen's Assn.
Springtown	Hixon & Mills
Steinburg	O. H. Erdman
Tohickon	J. D. Stover
Trumbanersville	Sinking Springs Cry.
Wismer	Union Dairy Association
Zion Hill	Henry B. Weiss
Butler Co.	
Conoquenessing	Stern & Dumbaugh
Portersville	H. Oliver
Portersville	Portersville Creamer Co.
Prospect	Prospect Creamery Co.
Saxonburg	Saxonburg Elgin Creamery
Slippery Rock	Slippery Rock Cream. Co.
Cambria Co.	
Carrolltown	Farmer's Creamery
Carbon Co.	
Little Gap	W. M. Benninger
Center Co.	
Bellefonte	Rock Farms Creamery
Bellefonte	Howard Creamery Cor.
Howard P. O.	C. M. Muffley
Rebersburg	Frank & Stover
Rebersburg	Spring Mills Creamery Co.
Spring Mills	Spring Mills Creamery
State College	State College Creamery
Chester Co.	
Anselma	Pikeland Creamery
Avondale	Lamborn's Creamery
Brandywine Manor	Reid's Creamery
Buck Run	Erellcloun Creamery
Buck Run	C. J. & J. E. Moore
Cedar Knoll	Lafayette Creamery
Chadds Ford	E. Darlington & Bro.
Chesterville	Marvell Bros.
Cochranville	Cochran Creamery
Cochranville	Cochranville Creamery
Collamer	Isaac Evans
Collamer	W. Evans & Son
Collamer	E. B. Herr
Cossart	Brandywine Creamery
Cossart	James B. Pyle
Doe Run	H. A. Clark
Doe Run	Darlington Creamery
Doe Run	Milton Darlington
Doe Run	H. A. Taylor
East Coventry	East Coventry Creamery
Elk View	Dr. Quimby
Elk View	T. Thomas Webb
Embreerville	J. L. Cunningham
Fairville	Sharpless Creamery
Font	Fairmont Creamery
Glen Roy	E. B. Herr
Hickory Hill	Hickory Hill Creamery
Homerville	Collamer Dairy
Honeybrook	C. D. & P. H. Emery
Honeybrook	Pennsylvania Creamery
Kelton	S. Morris Jones
Keimberton	Fry & Barr
Kembleville	Byers' Creamery
Kembleville	Kembleville Creamery
Kennett Square	Bernard's Creamery
Kennett Square	Kennett Square Cream.
Landenburg	Wm. Sharpless
Lenover	Alfred Sharpless
	H. S. Boyd
Leonard	Rosedale Creamery
Lincoln University	Niewig Bros.
Londonderry	J. H. Donald
London Grove	J. C. Sharpless
Marsh	Marsh Creamery
New Garden	New Garden Creamery
New London	Frank Kirk
New London	Theodore Kirk & Son
Nottingham	N'ting'm Co-operative Cream.
Oxford	Big Elk Dairies
Oxford	Hill Crest Creamery
Oxford	H. D. & E. A. Pugh
Oxford	Geo. D. Woodside & Co.
Parksburg	Cochran Creamery
Pheonixville	Red Bank Creamery
Pughtown	D. Wadleigh
Pomeroy	M. Darlington Sons
Roberts	Thomas Hatfield & Son
Russellville	Russellville Creamery
St. Peters	Farmers' Creamery
Schuylkill	Schuylkill Creamery
Sheeder P. O.	James C. Roberts & Son
Sheeder	Vincent Creamery
Spring City	Spring City Creamery
Suplee	Enterprise Creamery
Toughkenamon	Josiah Lamborn
Toughkenamon	Wm. Sharpless
Tweedale	E. B. Herr
Unionville	Unionville Creamery
Vincent	Brindlinger Bros.
Vincent	E. B. Gasher
Vincent	R. Heistand
Wagontown	J. H. Schrock & Son
Wagontown	Harry Schrack
Wagontown	West Cain Creamery
Warwick	Marst Creamery
West Chester	Allerton Creamery
West Vincent	Lewis H. Evans, Secretary
West Chester	George Faucetts & Son
West Chester	Harper Creamery
West Chester	Wm. B. Harvey
West Chester	Homestead Creamery
West Chester	West Chester Creamery
West Chester	West Chester Dairy
West Chester	E. Roberts' Creamery
Whitford	Whitford Creamery
Whitford	Arnold M. Wilber
Williams' Corners	Charles Buckwalter
Williams' Corners	Morris Mackissic
Willowdale	Willowdale Creamery
Wrightsdale	Wrightsdale Creamery
Crawford Co.	
Beaver Centre	Clark & Gates
Conneautville	J. W. Clark
Centreville	Centreville Creamery
Beaver Centre	Green, Clark & Co.
Crossingville	Crossingville Creamery
Dicksonburg	T. S. Laver
Espyville	A. W. Wall
Frenchtown	Augustus Polley
Guys Mills	L. C. McGaw
Jewell	Jewell Cheese Factory Co.
Jewell	N. O. Stanford
Hickernell	Hickernell Creamery
Lincolnville	Lincolnville Creamery
Linsville	A. B. Griffin
Long's Stand	A. J. Miller
Meadville	Leon C. McGraw Cheese Co.
Miller's Station	L. C. McGraw
Penn Line	L. C. McGraw
Pinney Corners	D. H. Nodine
Rundell's	McGaw & Cooper
Saegerstown	A. B. Long
Saegerstown	Long & Reiche
Spartansburg	Concord Creamery
Spartansburg	Hyde & Baker
Springboro	J. J. Howard
Townville	A. L. Squier
Troy Centre	Grove & McDowell
Troy Centre	Troy Centre Creamery
Westford	J. S. Martin

WestfordHart Espy
 WoodcockSherrod & Norris
 Clarion Co.Callensburg Creamery
 CallensburgPioneer Creamery Co.
 LickingvilleEnterprise Creamery
 MarblePioneer Creamery Co.
 NewmansvillePioneer Creamery Co.
 Clearfield Co.Clearfield Creamery Co.
 ClearfieldJames Mitchell
 Clinton Co.Clintondale Creamery Co.
 ClintondaleClintondale Creamery Co.
 LogantonLoganton Creamery
 SalonaSalona Creamery
 Columbia Co.Fairview Creamery
 BerwickFairview Creamery
 MillvilleMillville Creamery
 Cumberland Co.Cumberland Valley Creamery Co.
 AllenCumberland Valley Creamery Co.
 AllenJohn Hoemer
 Boiling SpringsWm. H. Kunkel
 CarlisleLetort Creamery
 CraigheadB. W. Hasler
 HattonKeystone Creamery
 MechanicsburgCumberland Valley Creamery Co.
 MechanicsburgMechanicsburg Creamery
 New KingstonCumberland Valley Creamery
 NewvilleBig Springs Separator
 ShippensburgB. D. Biggs & Son
 ShippensburgJacob Reigel
 Williams' MillsCumberland Valley Creamery Co.
 Williams' MillsGeo. Umberger
 Dauphin Co.Peter L. Stine
 BerksburgPeter L. Stine
 DeodateEzra C. Foltz
 FishervilleCornelius Bixler
 FishervilleFisherville Creamery
 GrantvilleStauffer & Rapp
 HarrisburgS. F. Barber
 HummelstownModel Creamery
 MillersburgC. F. Moyer
 Powl's ValleyC. Bixler & Son
 ProgressJohn H. Sheesley
 SwataraConewago Creamery
 Union DepositStauffer & Rapp
 Delaware Co.Miller & Heyburn
 Chadd's FordE. Darlington & Bro.
 CheneyThomas Cheney
 CheneyFrank G. Thomas
 ConcordvilleP. E. Sharpless
 DarlingDarlington Creamery
 DarlingtonM. F. Darlington & Son
 VillanovaVillanova Creamery
 WallingfordWallingford Creamery
 WallingfordWallingford Dairy Co.
 WardPennock E. Sharpless
 Elk Co.Ridgway Creamery Co.
 RidgwayRidgway Creamery Co.
 St. Mary'sSt. Mary's Creamery
 Erie Co.W. S. Boyle
 AlbionW. S. Boyle
 CorryCorry Creamery
 CorryJ. C. Wales
 EdinboroLavery & Co.
 ElginPier Willard
 FerdinandW. Union Cheese Factory
 Franklin CornersFrank Billings
 GreenfieldGreenfield Butter & Cheese Co.
 IvaseaPopulation Cheese Factory
 ItleyWilliam Marsh
 JuvaBarnes & Lockwood
 LaveryJ. S. Lavery
 LeBoeufC. M. Wheeler
 Lovell's StationCrowell's McCray
 LoysvilleDickinson, Gilbert & Keen
 McLaneWm. Marsh
 MysticJ. H. Waterhouse
 OvidMark L. Howard
 PhillipsvilleAlfred Moore
 PontR. B. Gates
 SterrettaniaJoseph H. Hauch
 SterrettaniaSterrettania Creamery
 TellerC. D. Faulkner
 Union CityGeo. W. Carroll
 WattsburgF. W. Edmunds
 WattsburgKeystone Creamery Co.
 WaterfordSharps Creamery
 WaterfordVananden & Gillet
 WaterfordJ. H. Brogdon
 WattsburgPratt Bros.
 WaterfordVananden & Gillet
 WaterfordO. H. Wells
 Fayette Co.M. R. Jacobs
 East RiversideM. R. Jacobs
 FarmingtonCheese Factory
 New HavenNew Haven Butter Co.
 Franklin Co.Hanover Creamery
 ChambersburgChambersburg Creamery
 ChambersburgChambersburg Creamery Co.
 EdenvilleFranklin Creamery Co.
 Green CastleF. W. Kulin
 Green VillageH. Fogelsange
 Green VillageGreen Village Creamery
 Lemaster'sJ. R. Lemaster & Son
 MarionCumberland City Creamery and Dairy
 MarkesJ. R. Lemaster & Son
 MercersburgMercersburg Creamery Co.
 Shady GroveNicodemus Creamery Assn.
 WaynesboroBlue Mountain Creamery
 WaynesboroA. L. Schaller
 WaynesboroChas. H. Stickell
 WilliamsonWilliamson Farmers' Co-operative Cream
 WilliamsonWilliamson Creamery Co.
 Willow HillMcCurdy & Elder
 Fulton Co.W. L. Sloan
 McConnellsburgMcConnellsburg Cream.
 McConnellsburgMcConnellsburg Cream.
 Greene Co.Carmichaels Creamery
 CarmichaelsCarmichaels Creamery
 Huntingdon Co.McAlevy's Fort Creamery
 McAlevy's FortMcAlevy's Fort Creamery
 MorrellMorrell Butter & Cheese Co.
 Neff's MillsNeff's Mills Creamery
 Pennsylvania FurnaceHoffman Bros.
 Indiana Co.Elder's Ridge Co-operative Creamery Co.
 Elder's RidgeElder's Ridge Co-operative Creamery Co.
 Homer CityH. C. English
 Homer CityHomer City Creamery
 Jefferson Co.J. N. Atwell & Co.
 Sugar HillJ. N. Atwell & Co.
 Juniata Co.Brown & Co.
 CocolamusBrown & Co.
 East SalemS. Schlegal
 East SalemEast Salem Creamery
 McAllistersvilleShellenberger & Hambricht
 Shellenberger & HambrichtShellenberger & Hambricht
 McCoysvilleB. C. Cubbelson
 MifflintownJ. G. Haldeman
 Port RoyalPort Royal Creamery
 ThompsonstownJ. G. Haldeman
 Lackawanna Co.Enderly Dairy
 GlenburnEnderly Dairy
 La PlumeScranton Creamery
 MoscowMoscow Creamery
 ScrantonWm. Conrad
 ScrantonE. S. Decker
 Lancaster Co.Coday Creamery
 BainbridgeBart Creamery
 BartBart Creamery
 BethesdaBethesda Creamery
 Bird-in-handBird-in-hand Creamery
 Bird-in-handF. Bowman
 Blue BallS. H. Musselman
 BuckBuck Creamery
 CambridgeCambridge Creamery
 CambridgeE. J. & P. H. Emery

CambridgeGeorge I. Emery
 ChristianaChristiana Creamery
 CocalicoCocalico Creamery
 ColemanvilleGeorge Garret
 CollensHerr & Maul
 DenverDaniel Gebble
 ElizabethtownElizabethtown Creamery
 EphrataJ. H. Yeiser
 FairlandJohn Reist
 FarmersvilleHenry J. Shaffer
 FertilityFertility Creamery Co.
 FlorinFlorin Creamery
 FurnessC. P. Grigg
 GapGap Creamery Co. Ltd.
 GlenolaJohnsonville Creamery
 GlenolaH. M. Stauffer
 GoshenThe Elam Dairy Co.
 GoshenGoshen Creamery
 GoshenAmos Walton
 Hahns townJohn Fry's Sons
 KirkwoodEzra Hess
 KirkwoodGraybill Stone
 LancasterLancaster Dairy Co.
 LandisvilleLevi H. Hershey
 LandisvilleLandisville Creamery
 LititzGarber Reist & Co.
 MannheimHershey Bros.
 MartillvilleM. C. Eshelman
 MascotStumptown Creamery
 MastersonvilleFarmers' Creamery Co.
 MastersonvilleMastersonville Creamery Assn.
 MayJohnson & Gilbert
 McSparranPeters' Creek Creamery
 McSparranWillowdale Creamery
 Mt. JoyFarmers' Creamery Co.
 Mt. JoyReist, Nissley & Son
 Mount NeboMt. Nebo Creamery Assn.
 New ProvidenceDickinson & Gilbert
 OctoraroJ. H. Brosius
 Pleasant GroveCarter & Mills
 Pleasant GroveConowingo Creamery
 QuarryvilleDickinson & Gilbert
 QuarryvilleQuarryville Creamery
 Reinhold StationReinhold Station Cream.
 SmithvilleHarry S. Wiggling & Co.
 SmyrnaSmyrna Creamery Co.
 Spruce GroveM. Keech
 Spruce GroveMilton Keech
 UnicornUnicorn Creamery
 UnicornJ. E. Moore
 White RockWm. G. Patton
 White RockWhite Rock Creamery Co.
 WindomChampion Creamery Co.
 Lawrence Co.Enon Valley Creamery
 Enon ValleyEnon Valley Creamery
 Neshannock FallsNeshannock Falls Creamery
 New CastleMidway Butter Co.
 PulaskiJohn S. Evans
 VolantJ. Wilken & Son
 Lebanon Co.Cleona Creamery Co.
 Belle GroveCleona Creamery Co.
 CampbelltownCampbelltown Creamery
 CleonaCleona Creamery Co.
 FontanaCleona Creamery Co.
 FredericksburgL. S. Gearhart
 JonestownZ. T. Gingrich
 LawnLawn Creamery Co.
 LebanonCity Creamery
 MillbachMillbach Creamery Co.
 MyerstownBasler Creamery
 MyerstownGeorge W. Donges
 MyerstownMengle & Yost
 OnoL. S. Gerhart
 PalmyraElizabethtown Creamery Co.
 PrescottHenry Haak
 Richland StationBig Spring Creamery Co.
 Richland StationG. E. Brownback
 Richland StationHenry Haak
 Lehigh Co.Spring Creek Creamery Co.
 AllentownSpring Creek Creamery
 AllentownLouise Creamery Co.
 CatasauquaHowertown Creamery
 CoopersburgW. H. Steinhilber
 CoopersburgLandis & Co.
 HosensackL. H. Brownell
 HosensackHosensack Creamery
 LanarkJ. C. Richard
 Lyon ValleyLyon Valley Creamery
 Lyon ValleyM. C. Rollman
 MacungieE. M. Laux & Co.
 MacungieMacungie Creamery
 MacungieSchuler Bros.
 New TripoliMiller & Gilmer
 PloverW. R. Schuler
 SigmondJacob Faust & Co.
 SteinsvilleSteinsville Creamery
 Vera CruzSchuler Bros.
 Vera CruzVera Cruz Creamery
 WanamakerJohn K. Fetherolf
 Werley's CornerO. P. Werley
 Luzerne Co.Rhode Treseott
 HazletonRhode Treseott
 HazletonJ. M. Williams
 WilkesbarreStandard Dairy Co. Ltd.
 WapwallopenWapwallopen Co-operative Creamery Co.
 WapwallopenWapwallopen Co-operative Creamery Co.
 Lycoming Co.J. M. Harmon
 Jersey ShoreJ. M. Harmon
 Larrys CreekGeo. L. Randall
 MuncyDavid Gundsum
 MuncyMuncy Creamery
 Roaring BranchE. B. Harter
 Roaring BranchAmerican Creamery Co.
 McKean Co.Eldred B. & C. Co.
 EldredEldred B. & C. Co.
 KaneKane Creamery Co.
 MyrtleR. G. Wooden
 Port AlleganyAcme Creamery Co.
 SmethportNaundah Butter & Creamery Co.
 Mercer Co.Greenville Creamery Co.
 GreenvilleGreenville Creamery Co.
 Grove CityLibrary Grove City Coll.
 Grove CityA. H. Beatty
 Indian RunT. P. Munnell
 JamestownW. R. Plant
 LondonLondon Creamery Co.
 MercerLouden Creamery Co.
 MercerMcDonaldson & Zahiser
 MercerMercer Creamery Co. Ltd.
 New VernonJ. A. Carey
 SharpsvilleSharpsville Creamery
 VolantS. A. Williams
 Mifflin Co.Allensville Creamery Co.
 AllensvilleAllensville Creamery Co.
 BellevilleBelleville Creamery
 MattawanaMattawana Creamery
 McVeytownJohn M. Hassinger
 ReedsvilleD. Z. Detweiler
 ReedsvilleA. L. Detweiler
 ReedsvilleReedsville Creamery
 Monroe Co.Beechpond Creamery Co.
 East StroudsburgBeechpond Creamery Co.
 GilbertM. G. Funk
 LamartineSalem Creamery Co.
 LimestoneGreenville Creamery
 StroudsburgStroudsburg Creamery Co.
 Montour Co.Mengle & Luckenbill
 WashingtonvilleMengle & Luckenbill
 Montgomery Co.J. P. Bustard
 CedarsColmar Creamery
 ColmarColmar Creamery
 ColmarJohn Holley
 CongoCongo Creamery
 CreameryPerkloemen Dairyman's Assn.
 EarlingtonH. C. Durstine

EarlingtonJ. G. Hunsicker
 EarlingtonJohn Landis
 East GreenvilleEast Greenville Cream.
 East GreenvilleAdam Kraus
 Fairview Village
 Fairview Village Creamery Assn.
 FranconiaJ. N. Freed
 FranconiaIndian Creek Creamery
 FranconiaJohn K. Landis
 FrederickGreen Tree Creamery
 Grater's FordA. G. Fly
 Grater's FordGrater's Ford Cream. Co.
 HatfieldDrake's Ford Creamery
 HatfieldAaron Tyson
 HillegasHillegas Creamery Co.
 HoppenvilleMcLean's Creamery
 HoppenvilleJ. T. Moyer
 Iron BridgeHarmony Grange Creamery
 KulpvilleTowamensing Creamery Co.
 LederachsvilleAndrew T. Garber
 LederachsvilleWide Awake Creamery
 LederachsvilleWorcester Creamery
 LimerickGarret E. Brownback
 LimerickSamuel Y. Eisenberg
 LinfieldG. E. Brownback
 LinfieldSamuel Y. Eisenberg
 LinfieldP. J. Reifsnider
 LuconLucon Creamery Co.
 MainlandMainland Creamery Co.
 NarcessaPlymouth Valley Creamery
 North WalesC. W. Hoffman
 ObeliskGreen Tree Dalrymen's Assn.
 PerkiomenvilleJ. M. Reed
 PottstownS. G. Fly
 PottstownMiller Bros. Creamery
 ProspectvilleProspectville Creamery Co.
 RoyersfordMingo Creamery
 SalfordvilleUpper Salford Creamery
 SanatogaSanatoga Creamery
 SassmansvilleSassmansville Creamery Co.
 SchwenksvilleWilliam Bromer
 SchwenksvilleDalrymen's Creamery Assn.
 SchwenksvilleWm. G. Liegler
 SkippackSchwenksville Cry. Assn.
 Spring HouseR. R. Jones
 TrappeSpring Valley Creamery
 Willow GroveWillow Grove Creamery
 WorcesterFarmers' Creamery Assn.
 YerkesYerkes Creamery
 Northampton Co.
 BathW. H. Landis
 BenningersW. M. Benninger & Son
 BingenCampbell & Appel
 Bushkill CentreBushkill Centre Cream.
 ButztownButztown Creamery
 CherryvilleL. D. Meckley
 HecktownHecktown Creamery
 HecktownW. H. Landis
 HecktownS. D. Steuben
 MoorestownH. S. Kratz
 NazarethH. S. Kratz
 NazarethNazareth Creamery Co.
 PetersvilleWilliam A. Slot
 PlainfieldPlainfield Creamery
 StockertownStockton Creamery Co.
 Stone ChurchW. M. Benninger
 Stone ChurchJordan McIntyre
 WalnutportW. M. Benninger
 WeaversvilleDalrymen's Assn.
 WeaversvilleWilliam M. Smith
 YoungsFrank Young
 Northumberland Co.
 ChillisquaqueC. L. Butler
 DewartDewart Creamery Co.
 MiltonPleasant Valley Creamery Co.
 MontandonCold Spring Creamery
 SedanWm. Dunn
 SunburyChas. R. Rinehart
 SunburySunbury Creamery Co.
 Perry Co.
 EllittsburgE. J. Kistler

LoysvilleLoysville Creamery Co.
 MillerstownJ. C. Kipp
 Pike Co.
 MatamorasMatamoras Creamery
 Potter Co.
 Bingham CentreW. J. Clark
 Bingham CentreR. H. Howe
 Bingham CentreRichard Labor
 ElmerCheese Factory
 NewfieldW. J. Grover
 RaymondsE. J. Conable
 RaymondsW. B. Perkins
 White's CornersWhite's Corners Cream.
 Schuylkill Co.
 OrwigsburgA. F. Kimmel
 Rauch'sSalem W. Koch
 TamaquaHenry M. Enterline
 Snyder Co.
 Beaver SpringsBeaver Springs Cream
 Globe MillsPalmer & Hackenburg
 McClureUlsh & Bro
 MiddleburgPalmer & Hackenburg
 Susquehanna Co.
 AlfordAlford Creamery
 Auburn Centre
 Shannan Hill Co-Op. Creamery
 Auburn 4 Corners
 Auburn 4 Corners Creamery Co.
 BirchardvilleC. P. Ball
 BirchardvilleBirchardville Creamery
 BirchardvilleExcelsior Creamery Co.
 BrooklynBrooklyn Creamery
 ChoconutChoconut Valley Creamery Co.
 DimockDimock Creamery Co.
 East RushEast Rush Creamery Co.
 East New Milford
 Mountain Lake Creamery Co.
 FairdaleC. P. Ball
 FairdaleFairdale Creamery
 FairdaleSeller Bros.
 Forest LakeForest Lake Creamery Co.
 Franklin ForksFranklin Forks Cream.
 GibsonHartford Dairy Co.
 HeartlakeHeartlake Creamery
 HarfordHarford Dairy Co.
 Hop Bottom
 Hop Bottom Dairy & Milk Co.
 Hop BottomHop Bottom Creamery
 KingsleyKingsley Creamery Co. Ltd.
 KingsleyKingsley Union Creamery
 KingsleyRobinson Woolworth & Kingsley
 Lawesville Centre
 Lawsville Co-Op. Creamery Co.
 Little MeadowsIron Bridge Creamery
 Little MeadowsLittle Meadows Creamery
 MiddletownIron Bridge Creamery Co.
 Middletown Centre
 Middletown Centre Creamery Co.
 MontroseMontrose Dairy Co.
 MontroseSeller Bros.
 MontroseBeech Bros.
 MontroseBeebe Creamery
 MontroseMontrose Creamery Co.
 MontroseSilver Lake Creamery
 New MilfordKingsley Creamery Co.
 New MilfordNew Milford Creamery Co.
 RushRush Centre Creamery Co.
 RushboroTreasurer
 RushboroJersey Hill Creamery Co.
 RushboroEast Rush Creamery Co.
 RushvilleRushville Creamery Co.
 Silver LakeQuaker Lake Creamery
 SpringvilleSpringville Creamery
 South GibsonHartford Dairy Co.
 TiffanyTiffany Creamery
 ThompsonThompson Creamery
 Tioga Co.
 AustinburgE. A. Bean
 AustinburgCheese Factory
 BalsamBalsam Cheese Factory
 East ChathamD. Avery

ElklandElkland Creamery
 ElklandCheese Factory
 Job's CornersWilliam G. Carpenter
 KeeneyvilleA. C. Close
 KeeneyvilleCheese Factory
 KnoxvilleE. A. Dean
 KnoxvillePennsylvania Creamery Co.
 KnoxvilleCheese Factory
 LawrencevilleLawrenceville Creamery
 LibertyWorlin Miller
 LibertyLiberty Valley Creamery Co.
 Little MarshW. Wass & Co.
 Little MarshCheese Factory
 MansfieldPitts & Spurr
 MansfieldWest Sullivan Creamery
 NelsonJ. B. Campbell
 NelsonNelson Cheese Factory
 NelsonNelson Separator & Butter Co.
 Round TopE. A. Close
 RutlandZimmer & Clark
 Stony ForkStony Fork Creamery
 SylvesterE. O. Bean
 TiogaKemp & Berg
 TiogaTioga Cheese Factory
 WellsboroG. B. Close
 WestfieldWestfield Cheese Factory
 Union Co.
 LewisburgBuffalo Valley Creamery
 MifflinburgCrystal Springs Creamery
 MifflinburgMifflinburg Creamery Co.
 Venango Co.
 Oil CityM. B. Crowther
 Warren Co.
 Ackley StationYoung & Clark
 Bear LakeFrank Parkhurst
 Chandlers' ValleyValley Creamery
 ColumbusJ. U. Wells
 GarlandGarland Cheese Factory
 Grand ValleyValley Creamery
 LanderJames Curtis
 LanderE. S. Griggs
 LottsvilleVern Grigg
 Spring CreekWillowdale Creamery
 Sugar GroveAcme Creamery Co.
 Sugar GroveGeorge Hampson
 YoungsvilleYoungsville Creamery Co.
 Washington Co.
 BulgerPeter Hermes
 BulgerOhio & Pgh. Milk Co.'s Cr'y
 West AlexanderMcAlmont & Chambers
 West AlexanderJas. A. Chambers & Co.
 Wayne Co.
 ArielLakeside Creamery
 Beach LakeBeach Pond Creamery
 ClemoClemon Creamery Co.

GravityGravity Co-Op. Creamery
 GravityGeorgetown Creamery
 HonesdaleCrystal Spring Creamery
 NewfoundlandHopdale Co-Op. Co.
 SulleyvilleG. & C. Smith
 SeeleyvilleSilver Creek Creamery Co.
 StarlightStarlight Dairy Co.
 Westmoreland Co.
 GreensburgChicago Dairy
 Mt. PleasantMt. Pleasant Creamery
 New Kensington
 New Kensington Butter Co.
 New KensingtonWillis Wonderly
 Scott HavenMcGrew & Bros.
 SmithtonSmithton Creamery
 Wyoming Co.
 FactoryvilleFactoryville Creamery
 FactoryvilleV. R. Gardner
 LaceyvilleHorseheads Creamery
 LaceyvilleBradford Co. Creamery Co.
 LemonLemon Creamery
 NicholsonNicholson Creamery
 NicholsonL. H. Pratt
 NicholsonLackawanna Dairy
 North MehoopanyVaughn Bros.
 York Co.
 Big MountA. B. Mummert
 BridgetonBridgeton Creamery
 Brodbeck'sBrodbeck's Sta. Creamery
 Brodbeck'sMiller & Bortner
 DeltaDaniel Hollingsworth
 DillsburgDillsburg & Elgin
 DoverDover Creamery
 East BerlinEast Berlin Creamery
 FeltonR. Grove & Brother
 GatchellvilleGatchellville Creamery
 GlennvilleGennville Creamery
 HanoverHanover Creamery
 HanoverYork & Adams Creamery
 HanoverRelst, Nissley & Co.
 HanoverHanover Produce Co.
 Muddy Creek Forks
 Pleasant Grove Creamery
 New FreedomAugust J. Gillen
 New ParkNew Park Creamery
 New SinsheimIsrael K. Zeigler
 Porter's SidingC. C. Wooden
 RailroadJ. A. Wetrick
 ShrewsburyShrewsbury Creamery
 South Beaver St. YorkMr. Budd
 Spring ForgeWagner & Swarts
 Slate HillCool Spring Creamery Co.
 SlabC. C. Smith & Bro.
 SwartstownSwartstown Creamery
 WellsvilleT. C. Cleaver

WHAT WE BREED

PURE BRED STOCK BRED BY MEMBERS OF THE PENNSYLVANIA
LIVE STOCK BREEDERS' ASSOCIATION

HORSES.

ARABS.

Name.	Postoffice.	County.
Herman Hoopes.....	Westchester,	Chester

MORGANS.

A. R. Van Tassel.....	DuBois,	Clearfield
Geo. A. Hogg.....	24th & R. R. Sts.,	Pittsburg
M. B. Stephens.....	Dilltown,	Indiana
R. F. Shannon.....	Edgeworth Sta.,	Allegheny

CLEVELAND BAY.

Powell Bros.....	Shadeland,	Crawford
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FRENCH COACH.

Powell Bros.....	Shadeland,	Crawford
Julius Le Moyne.....	Washington,	Washington

CLYDESDALE.

Powell Bros.....	Shadeland,	Crawford
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FRENCH DRAFT.

Powell Bros.....	Shadeland,	Crawford
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SUFFOLK PUNCH.

Powell Bros.....	Shadeland,	Crawford
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BELGIAN.

Powell Bros.....	Shadeland,	Crawford
Lyman Hunter.....	Hartstown,	Crawford

STANDARD-BRED.

Benj. McKeehan.....	Mt. Rock,	Cumberland
W. C. Norton.....	Waymart,	Wayne
Fomer Bros.....	Greenville,	Mercer
Blair (Carriage type).....	Hartstown,	Crawford
Henry Palmer.....	Avondale,	Chester
Ezra Michener.....	Michener,	Bucks
Powell Bros.....	Shadeland,	Crawford
W. E. Stevenson.....	Burgettstown,	Washington
J. M. Main & Sons.....	Shippensburg,	Cumberland
D. H. Waite.....	Warrior's Mark,	Huntingdon
W. H. Ridge.....	Trevoise,	Bucks

SHIRE.

Sam'l McCreary.....	Volant,	Lawrence
Wm. L. Christley.....	Slippery Rock,	Butler
Geo. A. Hogg.....	24th & R. R. Sts.,	Pittsburg
Powell Bros.....	Shadeland,	Crawford

PERCHERONS.

D. S. Kloss.....	Tyrone,	Blair
A. M. Dickson & Son.....	Cochranon,	Crawford
E. B. Boyle.....	Canonsburg,	Washington
J. M. Main & Sons.....	Shippensburg,	Cumberland
Geo. A. Hogg.....	24th & R. R. Sts.,	Pittsburg
W. A. McCoy & Sons.....	Mercer,	Mercer

Powell Bros.....	Shadeland,	Crawford
Lyman Hunter.....	Hartstown,	Crawford
Wm. F. Gable.....	Wyebrook,	Chester
John W. Burket.....	Tyrone,	Blair
W. M. Lyon & Son.....	Wyalusing,	Bradford

THOROUGHBREDS.

R. S. Hartley.....	Youngsville,	Warren
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HACKNEYS.

Geo. A. Hogg.....	24th & R. R. Sts.,	Pittsburg
Powell Bros.....	Shadeland,	Crawford
Lyman Hunter.....	Hartstown,	Crawford

SHETLAND PONIES.

Wm. F. Gable.....	Wyebrooke,	Chester
W. M. Thompson.....	Uniontown,	Fayette
F. B. Stewart.....	Espyville,	Crawford
Powell Bros.....	Shadeland,	Crawford

CATTLE.

ABERDEEN-ANGUS.

W. H. Rink.....	Johnstown,	Cambria
W. L. Christley.....	Slippery Rock,	Butler
Jas. Blair.....	Hartstown,	Crawford
Bayard Bros.....	Waynesburg,	Greene
Penn'a State College.....	State College,	Center
Geo. Black.....	Dayton,	Armstrong
Lyman Hunter.....	Hartstown,	Crawford

AYRSHIRES.

Willis W. Hopkins.....	Aldenville,	Wayne
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BROWN SWISS.

R. I. Young.....	Middletown,	Dauphin
W. H. H. Riddle.....	Butler,	Butler

DEVONS.

B. F. Jones.....	South Montrose,	Susq.
A. S. Worden.....	Frederick,	Md.
J. Cheston Morris.....	Westchester,	Chester
Powell Bros.....	Shadeland,	Crawford

POLLED ALBIONS.

B. E. Ferris.....	Hector,	Potter
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HOLSTEINS.

W. T. Suter.....	Riverside,	Northumberland
Sam'l McCreary.....	Volant,	Lawrence
H. M. Lyon & Sons.....	Wyalusing,	Bradford
J. B. Henderson.....	Burgettstown,	Washington
B. F. Jones.....	South Montrose,	Susq.
A. S. Worden.....	Frederick,	Md.
Geo. G. Paxton.....	Houston,	Washington
W. E. Stevenson.....	Burgettstown,	Washington
D. S. Kloss.....	Tyrone,	Blair
J. M. Quivey & Sons.....	Houston,	Washington

J. M. Paxton.....	Houston,	Washington
Powell Bros.....	Shadeland,	Crawford
D. E. Notestine.....	Lewistown,	Mifflin
Nelson Poorbaugh.....	Mt. Pleasant,	Westmoreland

POLLED DURHAMS.

D. C. Andrews.....	West Newton,	Westm'd
Lee R. Scott.....	Burgettstown,	Washington
Chas. Buchanan.....	Utica,	Venango
J. C. Mattern & Sons.....	Hollidaysburg,	Blair

RED POLLS.

B. E. Ferris.....	Hector,	Potter
N. O. Brownlee.....	Crothers,	Washington
A. M. Dickson & Son.....	Cochranon,	Crawford
D. Norman App.....	Selinsgrove,	Snyder
John F. Zook.....	Belleville,	Mifflin
Sidney F. Isett.....	Spruce Creek,	Huntingdon

SHORTHORNS.

C. A. Hershey.....	Gettysburg,	Adams
W. M. Thompson.....	Uniontown,	Fayette
F. N. Hubbard.....	Troy,	Bradford
John A. Cummins.....	Waynesburg,	Greene
Geo. G. Strosnider.....	Waynesburg,	Greene
G. D. Walker.....	Salona,	Clinton
J. L. Stouffer.....	Southwest,	Westmoreland
Jos. T. Fleming.....	Belleville,	Mifflin
W. J. Monroe.....	Greensburg,	Westmoreland
W. C. Black.....	Mercer,	Mercer
B. L. Post's Sons.....	West Alexander,	Wash.
A. S. Eagleson & Sons.....	Washington,	Wash.
L. Douthett.....	Thornhill,	Allegheny
W. A. McCoy & Sons.....	Mercer,	Mercer
Lee R. Scott.....	Burgettstown,	Washington
Penn'a State College.....	State College,	Center
A. G. Shaffer.....	Rural Valley,	Armstrong
L. D. May.....	Granville Center,	Bradford
R. C. Vance.....	Burgettstown,	Washington
R. L. Munce.....	Canonsburg,	Washington
D. H. Waite.....	Warrior's Mark,	Huntingdon
E. B. Boyle.....	Canonsburg,	Washington

GUERNSEYS.

T. M. McKee.....	Lewistown,	Mifflin
Penn'a State College.....	State College,	Center
J. E. Woodmansee.....	Lake Como,	Wayne
Nelson Poorbaugh.....	Mt. Pleasant,	Westm.
Wm. F. Gable.....	Wyebrooke,	Chester
R. S. Hartley.....	Youngsville,	Warren
Irwin F. McKee.....	Washington,	Washington
H. H. Snively.....	Willow Street,	Lancaster
Wm. Thompson, Jr.....	Lemont,	Center
Geo. G. Paxton.....	Houston,	Washington
J. H. Peachy.....	Belleville,	Mifflin
H. C. Bughman.....	Greensburg,	Westmoreland
R. F. Shannon.....	907 Liberty St.,	Pittsburg
Henry Palmer.....	Avondale,	Chester
Ezra Michener.....	Michener,	Bucks
H. W. Comfort.....	Fallsington,	Bucks
R. S. Love.....	Mt. Pleasant,	Westmoreland
Shook Bros.....	Spring Mills,	Center

JERSEYS.

Jas. I. Thompson.....	Lemont,	Center
Chas. A. Porter.....	Torresdale,	Philadelphia
Ludwig S. Filbert.....	Fox Chase,	Philadelphia
Geo. S. Barnhart.....	Greensburg,	Westmoreland
R. I. Young.....	Middletown,	Dauphin
Geo. Erk.....	Seelyville,	Wayne
B. W. McKeehan.....	Mt. Rock,	Cumberland
A. L. Martin.....	Harrisburg,	Dauphin
Edward Walter.....	West Chester,	Chester
A. P. Warren.....	Elizabeth,	Allegheny
Jas. H. Cowan.....	Duquesne,	Allegheny
J. M. Main & Sons.....	Shippensburg,	Cumberland
John B. Kepple.....	Greensburg,	Westmoreland
W. F. Shrum.....	Adamsburg,	Westmoreland
M. P. Shoemaker & Bro.....	Greensburg,	West.
G. H. Knapp.....	Aldenville,	Wayne
L. W. Lighty.....	East Berlin,	Adams

R. S. Hartley.....	Youngsville,	Warren
J. I. Barley.....	Baker's Summit,	Bedford
W. E. & J. J. Perham.....	Niagara,	Wayne
W. C. Norton.....	Waymart,	Wayne
S. E. Nivin.....	Landenburg,	Chester
A. T. Replogle.....	Waterside,	Bedford
Austin Leonard & Son.....	Troy,	Bradford
W. F. Wagner.....	Harrison City,	Westmoreland
Clarence M. Glasgow.....	Calvin,	Huntingdon
Herman Hoopes.....	Westchester,	Chester
W. W. Harrison.....	119 N 11th St.,	Philadelphia
R. F. Shannon.....	907 Liberty St.,	Pittsburg
Henry H. Randt.....	Pipersville,	Bucks
J. B. Wylie.....	Washington,	Washington
W. F. McSparran.....	Furniss,	Lancaster
E. B. Boyle.....	Canonsburg,	Washington
J. H. Silvis.....	Greensburg,	Westmoreland
M. E. Reeder.....	Muncy,	Lycoming
T. M. Shively.....	Mifflinburg,	Union
J. A. Sheerer.....	.....	.....
T. A. Scheirer.....	Slatington,	Lehigh

SWINE.

BERKSHIRES.

J. N. Glover.....	Vicksburg,	Union
A. S. Worden.....	Frederick,	Md.
R. W. Crothers & Son.....	Taylorstown,	Wash.
Geo. W. Mellotte.....	Lisbon,	Ohio
Edward Walter.....	Westchester,	Chester
J. M. Main & Sons.....	Shippensburg,	Cumberland
Nelson Poorbaugh.....	Mt. Pleasant,	Westm'd
Sam'l McCreary.....	Volant,	Lawrence
Jas. L. Henderson.....	Washington,	Washington
L. W. Lighty.....	East Berlin,	Adams
A. H. Erdman.....	Wiconisco,	Dauphin
J. B. Henderson.....	Burgettstown,	Washington
John A. Cummins.....	Waynesburg,	Greene
G. D. Walker.....	Salona,	Clinton
Ralph Minner & Sons.....	Mercer,	Mercer
J. Cheston Morris.....	Westchester,	Chester
T. M. Shively.....	Mifflinburg,	Union
W. C. Black.....	Mercer,	Mercer
Homer Bros.....	Greenville,	Mercer
H. C. Bughman.....	Greensburg,	Westmoreland
R. F. Shannon.....	Pittsburg,	Allegheny
A. S. Eagleson & Sons.....	Washington,	Wash.
N. O. Brownlee.....	Crothers,	Washington
S. V. McDowell & Son.....	Fredonia,	Mercer
W. F. McSparran.....	Furniss,	Lancaster
J. M. Paxton.....	Houston,	Washington
W. F. Holtzer.....	Greensburg,	Westm'd
W. H. Gray.....	Brookville,	Jefferson
D. H. Waite.....	Warrior's Mark,	Huntingdon
T. J. Erdley.....	Lewisburg,	Union

DUROC-JERSEYS.

Wm. Thompson, Jr.....	Lemont,	Center
B. L. Post's Sons.....	West Alexander,	Wash.
George Black.....	Dayton,	Armstrong
S. S. Blyholder.....	Neale,	Armstrong
D. E. Notestine.....	Lewistown,	Mifflin
Sidney F. Isett.....	Spruce Creek,	Huntingdon

CHESTER WHITES.

G. S. Barnhart.....	Greensburg,	Westmoreland
H. M. Lyon & Sons.....	Wyalusing,	Bradford
J. C. Mattern & Sons.....	Hollidaysburg,	Blair
R. L. Munce.....	Canonsburg,	Washington
Edward Walter.....	Westchester,	Chester
A. P. Warren.....	Elizabeth,	Allegheny
J. E. Woodmansee.....	Lake Como,	Wayne
Benj. McKeehan.....	Mt. Rock,	Cumberland
W. F. Gable.....	Wyebrooke,	Chester
H. M. Lyon & Sons.....	Wyalusing,	Bradford
Willis W. Hopkins.....	Aldenville,	Wayne
F. W. Levis.....	Chadd's Ford,	Chester
A. T. Replogle.....	Waterside,	Bedford
Jos. T. Fleming.....	Belleville,	Mifflin
W. J. Monroe.....	Greensburg,	Westmoreland
D. S. Kloss.....	Tyrone,	Blair
Sidney F. Isett.....	Spruce Creek,	Huntingdon

W. A. McCoy & Sons.....Mercer, Mercer
 A. M. Dickson & Son (O I C)
 Cochran, Crawford
 S. V. McDowell & Son.....Fredonia, Mercer
 D. W. Jones.....Wilmore, Cambria
 J. H. Silvis.....Greensburg, Westm'd
 J. N. Glover.....Vicksburg, Union
 E. B. Boyle.....Canonsburg, Washington
 T. M. McKee.....Lewistown, Mifflin
 R. C. Vance.....Burgettstown, Washington

OZARK OR MULE FOOT HOGS.

A. M. Dickson & Son.....Cochran, Crawford

POLAND-CHINAS.

J. C. Mattern & Sons.....Hollidaysburg, Blair
 D. Norman App.....Selinsgrove, Snyder
 A. G. Shaffer.....Rural Valley, Armstrong
 A. P. Warren.....Elizabeth, Allegheny
 Edward Walter.....Westchester, Chester
 C. A. Hershey.....Gettysburg, Adams
 W. F. Wagner.....Harrison City, Westmoreland
 J. L. Stouffer.....Southwest Westmoreland
 Burns & Adams.....Imperial, Allegheny
 J. H. Peachey.....Belleville, Mifflin
 T. M. McKee.....Lewistown, Mifflin
 R. S. Love.....Mt. Pleasant, Westmoreland
 T. M. Shively.....Mifflinburg, Union

SHEEP.

BLACKTOP MERINOS.

John M. Berry.....Wylandville, Washington
 R. P. Berry.....Eighty-four, Washington
 R. L. Munce.....Canonsburg, Washington
 E. B. Boyle.....Canonsburg, Washington

DELAINE MERINOS.

Geo. G. Paxton.....Houston, Washington
 Lee R. Scott.....Burgettstown, Washington
 E. B. Boyle.....Canonsburg, Washington
 R. L. Post's Sons.....West Alexander, Wash.
 R. W. Crothers & Son.....Taylorstown, Wash.

CHEVIOT.

S. V. McDowell & Son.....Fredonia, Mercer
 A. M. Dickson & Son.....Cochran, Crawford

SOUTHDOWNS.

Ludwig S. Filbert.....Fox Chase, Philadelphia
 Edward Walter.....Westchester, Chester
 W. A. McCoy & Sons.....Mercer, Mercer
 R. C. Vance.....Burgettstown, Washington

DORSETS.

T. M. McKee.....Lewistown, Mifflin
 A. S. Eagleson.....Washington, Washington
 J. B. Henderson.....Burgettstown, Washington
 S. Shaffer.....Princeton, Lawrence
 J. B. Wylie.....Washington, Washington
 Henry Palmer.....Avondale, Chester
 A. M. Dickson & Son.....Cochran, Crawford

LINCOLNS.

Benj. McKeehan.....Mt. Rock, Cumberland
 T. M. Shively.....Mifflinburg, Union
 W. A. McCoy & Sons.....Mercer, Mercer

COTSWOLDS.

S. V. McDowell & Son.....Fredonia, Mercer
 R. S. Love.....Mt. Pleasant, Westmoreland

HAMPSHIRE.

W. J. Monroe.....Greensburg, Westmoreland
 Jas. Blair.....Hartstown, Crawford
 Edward Walter.....Westchester, Chester
 A. M. Dickson & Son.....Cochran, Crawford

LEICESTERS.

W. A. McCoy & Sons.....Mercer, Mercer

OXFORDS.

A. G. Shaffer.....Rural Valley, Armstrong
 A. S. Worden.....Frederick, Md.

SPANISH MERINOS.

Jas. Lindsay & Sons.....Utica, Venango
 Lee R. Scott.....Burgettstown, Washington

SHROPSHIRE.

J. C. Mattern & Sons.....Hollidaysburg, Blair
 J. F. Lantz & Co.....Wychbrooke, Chester
 Edward Walter.....Westchester, Chester
 Wm. F. Gable.....Wychbrooke, Chester
 C. A. Hershey.....Gettysburg, Adams
 S. Shaffer.....Princeton, Lawrence
 A. T. Replogle.....Waterside, Bedford
 Jos. T. Fleming.....Belleville, Mifflin
 Clarence M. Glasgow.....Calvin, Huntingdon
 W. C. Black.....Mercer, Mercer
 B. L. Post's Sons.....West Alexander, Wash.
 Sidney F. Isett.....Spruce Creek, Huntingdon
 Herman Hoopes.....Westchester, Chester
 D. S. Kloss.....Tyrone, Blair
 J. C. Andrews.....Mattie, Bedford
 Wm. Thompson.....Lemont, Center
 John W. Burket.....Tyrone, Blair
 D. W. Jones.....Wilmore, Cambria

ANGORA GOATS.

R. S. Love.....Mt. Pleasant, Westmoreland
 A. M. Dickson & Son.....Cochran, Crawford

POULTRY.

PLYMOUTH ROCKS.

W. J. Monroe.....Greensburg, Westmoreland
 W. T. Suter (W.).....Riverside, Northumberland
 J. A. Herr (B.).....Mill Hall, Clinton
 M. N. Clark (B.).....Claridge, Westmoreland
 Edward Walter.....Westchester, Chester
 J. F. Lantz & Co.....Wychbrooke, Chester
 Penn'a State College, Center
 A. P. Warren (B&Buff).....Elizabeth, Allegheny
 T. M. McKee (B.).....Lewistown, Mifflin
 D. N. App (B & W).....Selinsgrove, Snyder
 Jas. H. Cowan.....Duquesne, Allegheny
 Nelson Poorbaugh (Wh).....Mt. Pleasant, West.
 C. A. Hershey (B).....Gettysburg, Adams
 M. P. Shoemaker & Bro. (W).....Greensburg, West.
 W. H. Gray (B).....Brookville, Bradford
 H. M. Lyon & Sons (B).....Wyalusing, Bradford
 D. W. Jones.....Wilmore, Cambria
 Geo. S. Barnhart.....Greensburg, Westmoreland
 Wm. Thompson.....Lemont, Center
 Sidney F. Isett.....Spruce Creek, Huntingdon
 J. I. Barley.....Baker's Summit, Bedford
 John A. Cummins (B).....Waynesburg, Greene
 G. D. Walker.....Salona, Clinton
 A. T. Replogle.....Waterside, Bedford
 Dr. J. Stewart Lacock (Wh).....Pittsburg, Ally.
 W. F. Wagner (B).....Harrison City, Westm'd
 T. L. Stouffer (B).....Southwest, Westmoreland
 Jos. T. Fleming (Wh).....Belleville, Mifflin
 Burns & Adams.....Imperial, Allegheny
 Wm. Thompson, Jr. (B).....Lemont, Center
 J. H. Peachey (B).....Belleville, Mifflin
 J. Wolf Evans (Bf).....Spring Mills, Center
 Herman Hoopes (B).....Westchester, Chester
 A. S. Eagleson & Sons (B).....Washington, Wash.
 N. O. Brownlee (B).....Crothers, Washington
 S. V. McDowell & Sons (B).....Fredonia, Mercer
 Henry Palmer (Bf).....Avondale, Chester
 J. C. Andrews (B).....Mattie, Bedford
 W. A. McCoy & Sons (Wh).....Mercer, Mercer
 Nelson Bros. (B).....Grove City, Mercer
 Penn'a State College (B).....State College, Center
 R. S. Love (W).....Mt. Pleasant, Westmoreland
 J. M. Paxton (Bf).....Houston, Washington
 J. H. Silvis.....Greensburg, Westm'd
 D. H. Waite.....Warrior's Mark, Huntingdon

D. E. Notestine.....Lewistown, Mifflin

COCHINS.

J. N. Glover (B).....Vicksburg, Union
 Pa. State College (RC).....State College, Center
 John M. Berry (Wh).....Wylandville, Wash.
 Pa. State College (Bf).....State College, Center

RHODE ISLAND REDS.

R. F. Shannon.....Pittsburg, Allegheny
 Pa. State College (PC).....State College, Center
 D. Norman App.....Selinsgrove, Snyder

ORPINGTONS.

R. F. Shannon.....Pittsburg, Allegheny
 J. N. Glover.....Vicksburg, Union

BLACK POLISH.

Pa. State College (WC).....State College, Center

WYANDOTTES.

Jas. I. Thompson (W).....Lemont, Center
 Pa. State College.....State College, Center
 Julius LeMoyné (Wh).....Washington, Wash.
 F. E. Traver (Buff).....Wychbrooke, Chester
 R. W. Crothers & Son (W).....Taylorstown, Wash.
 A. G. Shaffer (Sil).....Rural Valley, Armstrong
 Wm. F. Gable (Bf).....Wychbrooke, Chester
 C. A. Hershey (Wh).....Gettysburg, Adams
 L. W. Lighty (Wh).....East Berlin, Adams
 D. W. Jones.....Wilmore, Cambria
 B. F. Jones (Wh).....South Montrose, Susq.
 Dr. J. Stewart Lacock (Wh).....Pittsburg, Ally.
 W. F. Holtzer (Bf).....Greensburg, Westmoreland
 B. L. Post's Sons (Wh).....West Alexander, Wash.
 Homer Bros. (Bf).....Greenville, Mercer
 H. C. Bughman (SL).....Greensburg, Westm'd
 D. H. Snavely.....Willow Street, Lanc.
 D. S. Kloss (Wh).....Tyrone, Blair
 Ezra Michener.....Michener, Bucks
 Pa. State College (W).....State College, Center
 R. S. Love (W).....Mt. Pleasant, Westm'd

MINORCAS.

Wm. F. Gable.....Wychbrooke, Chester
 R. S. Hartley.....Youngsville, Warren
 Pa. State College (Blk).....State College, Center
 R. F. Shannon (Bl).....Edgeworth Sta., Allegheny

BRAHMAS.

Edward Walter.....Westchester, Chester
 B. E. Ferris (Lt).....Hector, Potter
 Clarence M. Glasgow (Lt).....Calvin, Huntingdon
 Pa. State College (Lt).....State College, Center

LEGHORNS.

Jas. Lindsey & Son (R C B).....Utica, Venango
 W. T. Suter (R C W).....Riverside, Northumbld
 G. S. Barnhart (Bf).....Greensburg, Westm'd
 J. Wolf Evans (Scw W & B) Spring Mills, Cent'r
 R. L. Munce (S C B).....Canonsburg, Wash.
 J. E. Woodmansee (Scw).....Lake Como, Wayne
 A. P. Warren (Bf).....Elizabeth, Allegheny
 Nelson Poorbaugh (Wh).....Mt. Pleasant, West.
 M. P. Shoemaker & Bro. (Br).....Gr'nsg, West.
 W. H. Gray (Wh).....Brookville, Jefferson
 L. W. Lighty (Wh).....East Berlin, Adams
 Willis W. Hopkins (Br).....Aldenville, Wayne
 R. S. Hartley (Bf & Br).....Youngsville, Warren
 Geo. G. Strosnider (Br).....Waynesburg, Greene
 B. L. Post's Sons (RCB).....W. Alexander, Wash.
 H. C. Bughman (Br).....Greensburg, Westm'd
 Nelson Bros. (S C B).....Grove City, Mercer
 Pa. State College (SCW) State College, Center
 R. S. Love (B & W).....Mt. Pleasant, Westm'd
 W. F. Holtzer (Wh).....Greensburg, Westm'd

BANTAMS.

H. C. Bughman.....Greensburg, Westmoreland
 W. A. McCoy (WhG).....Mercer, Mercer
 R. F. Shannon (BBRGame).....Edgeworth Sta., Allegheny

R. S. Hartley (Bf Coch).....Youngsville, Warren
 E. B. Boyle.....Canonsburg, Washington

GAMES.

Pa. State College.....State College, Center
 R. F. Shannon.....Edgeworth Sta., Allegheny

FAVEROLLES.

Pa. State College.....State College, Center

PEAFOWLS.

J. C. Andrews.....Mattie, Bedford
 W. A. McCoy & Sons.....Mercer, Mercer
 D. W. Jones.....Wilmore, Cambria

GUINEAS.

W. A. McCoy & Sons (Wh).....Mercer, Mercer

FERRETS.

Nelson Bros.....Grove City, Mercer

DUCKS.

Benj. McKeehan (Pekin).....Mt. Rock, Cumberland
 W. H. Gray (Pekin).....Brookville, Jefferson
 W. A. McCoy & Sons.....Mercer, Mercer

TURKEYS.

B. L. Post's Sons (MB).....Claysville, Wash.
 A. G. Shaffer.....Rural Valley, Armstrong
 D. N. App (WHol).....Selinsgrove, Snyder
 W. H. Gray (Br).....Brookville, Jefferson
 B. F. Jones (Bl).....South Montrose, Susq.
 J. L. Stouffer (Br).....Southwest, Westmoreland
 Clarence M. Glasgow (Br).....Calvin, Huntingdon
 Henry H. Randt.....Pipersville, Bucks
 J. B. Wylie (WH).....Washington, Washington
 W. A. McCoy & Sons (WH).....Mercer, Mercer
 D. W. Jones.....Wilmore, Cambria

WHITE-TIPPED BLACK SPANISH.

Pa. State College.....State College, Center

GEESE.

W. H. Gray (Tou).....Brookville, Jefferson
 W. A. McCoy & Sons (Emb).....Mercer, Mercer

DOGS.

SCOTCH COLLIES.

Austin Leonard & Son.....Troy, Bradford
 Clarence M. Glasgow.....Calvin, Huntingdon
 J. C. Andrews.....Mattie, Bedford
 Nelson Bros.....Grove City, Mercer
 D. W. Jones.....Wilmore, Cambria
 Benj. McKeehan.....Mt. Rock, Cumberland
 M. P. Shoemaker & Bro.Greensburg, West.
 W. H. Gray.....Brookville, Jefferson
 H. M. Lyon & Sons.....Wyalusing, Bradford
 R. S. Hartley.....Youngsville, Warren
 J. I. Barley.....Baker's Summit, Bedford
 F. B. Stewart.....Epsville, Crawford
 J. Grier Dain.....Malvern, Chester
 Nelson Bros.....Grove City, Mercer
 T. M. McKee.....Lewistown, Mifflin

SCOTCH TERRIERS.

R. F. Shannon.....Pittsburg, Allegheny

BULL TERRIERS.

W. C. Norton.....Waymart, Wayne

ENGLISH SHEEP DOGS.

Benj. McKeehan.....Mt. Rock, Cumberland

FOX HOUNDS.

Willis W. Hopkins.....Aldenville, Wayne

BEAGLES.

J. F. Lantz & Co.....Glenmoore, Chester

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The True Temper label on a corn hook is the strongest guarantee expert manufacturers can give you, that the *quality* is the *finest* and the *shape* the *most correct* they can produce.

No tool—Fork, Hoe, Rake, Hook, Weeder, whatever it may be, is allowed to wear the True Temper Label until it has been tested and found to come up to its standard of requirements.

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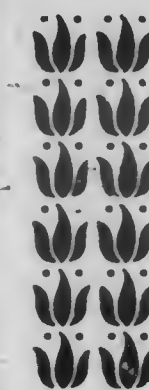
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